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Competitiveness of the South African citrus fruit industry relative to its southern hemisphere competitors

by

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God Bless You All...

DECLARATION

I declare that the study titled: 'COMPETITIVENESS OF THE SOUTH AFRICAN CITRUS FRUIT INDUSTRY RELATIVE TO ITS SOUTHERN HEMISPHERE COMPETITORS' is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references. It has been submitted and shall not be submitted in any form to any institution of higher learning for the award of any degree.

_____ _____

Signature of student Date

ABSTRACT

The South African citrus fruit industry faces enormous challenges in the global markets, such as an increasing demand for higher quality citrus fruits, as well as increasing fierce competition from the southern hemisphere citrus producing countries. Its long history of global integration makes it highly sensitive to international developments, as well as domestic ones.

The purpose of the study is to investigate the competitiveness of the South African citrus fruit industry relative to its southern hemisphere competitors – namely, Argentina, Australia, Uruguay, Chile and Peru. Both local and international literature on the citrus fruit industries was used as part of the analysis. In addition to this, a variety of methods and techniques were applied. These included the three well-recognised indices which were used to calculate the competitive indices of various citrus fruit product categories – namely, the Balassa Revealed Comparative Advantage (RCA#) index, the Net Export index (NX_i) and the Relative Revealed Comparative Trade Advantage (RTA) index. Time series data on South African and southern hemisphere major producing countries' citrus fruit imports and exports were used to calculate the competitiveness indices using Excel spreadsheets. A structured questionnaire was also used to collect both qualitative and quantitative data of expert views from key industry stakeholders. Data collected were analysed using Excel spreadsheets and the Porter methodology.

The competitiveness analysis of this study clearly pointed out that the South African citrus fruit industry reveals more competitive advantage in some citrus fruit products than its southern hemisphere counterparts. The results of the RCA#, NX_i and RTA indices analyses clearly showed that the domestic industry has a stronger and relatively higher revealed competitive advantage in three citrus fruit product categories – namely, oranges, grapefruit and grapefruit juice than its southern hemisphere competitors. However, its orange competitiveness decreases when moving from primary orange to orange juice. This means that the value-adding opportunities are still lacking in the orange sub-sector. One possible reason for this could be the high rates of return recorded for farm-level applications of technology for most primary orange commodities.

This study identified the availability of skilled employees, quality of unskilled labour, cost of doing business in the industry, services from financial institution, electricity supply, land reform and some other government policies, such as trade policy, labour policy, BEE policy

and tax system as the major factors impeding the competitiveness of the industry. The list also included the current climatic conditions, high incidences of HIV/AIDS and crime, economic instability and the cost of technology and infrastructure in the industry.

Despite the challenges mentioned above, quality of skilled labour; general level of development and quality of infrastructure and technology in the industry; quality of soils; the availability of scientific research institutions and the collaboration of the industry with these institutions; availability and quality of local suppliers of primary inputs; and market information flow were found to have a positive influence on the competitiveness of the industry. In order for the industry to enhance its competitiveness, a number of recommendations and strategies are suggested at the end of this study.

KEY WORDS

Citrus fruit industry, Revealed Comparative Advantage index, Net Export index, Relative Revealed Comparative Trade Advantage index, Porter's competitive diamond model

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LIST OF ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ARC	Agricultural Research Council
BBBEE	Broad-Based Black Economic Empowerment
BEE	Black Economic Empowerment
CBS	Citrus Black Spot
CEP	Comparative Export Performance
CGA	Citrus Growers Association
CMS	Constant Market Share
CRI	Citrus Research International
DAFF	Department of Agriculture, Forestry and Fisheries
DRC	Domestic Resource Cost
EU	European Union
FAO	Food and Agriculture Organisation
FPEF	Fresh Produce Exporters Forum
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
HS	Harmonised System
ITC	International Trade Centre
NSP	Net Social Probability
NX_i	Net Export index
OECD	Organisation for Economic Co-operation and Development
PAM	Policy Analysis Matrix
PPECB	Perishable Products Exporters Control Board
RCA	Revealed Comparative Advantage
RCR	Resource Cost Ratio
R&D	Research and Development
RMA	Relative Import Advantage
RTA	Revealed Comparative Trade Advantage
RXA	Relative Export Advantage
SPS	Sanitary and Phytosanitary
SWOT	Strengths, Weaknesses, Threats and Opportunities
TPI	Trade Performance Index
UK	United Kingdom
USA	United States of America
US$	United States of America Dollar

CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1. Background

Jan van Riebeeck planted the first citrus fruit trees in 1654 near Table Mountain in Western Cape (National Department of Agriculture, 2003). Since then, the citrus fruit industry has grown and currently represents one of South Africa's most important agro-commodities by value and volume. Citrus fruits currently constitute one of the most important horticultural crops. In terms of gross value, the industry is currently the third largest horticultural industry after the deciduous fruit and vegetables industries. It earned just over R7.7 billion in the 2011/12 season, which is approximately 4.7 percent of the total agricultural gross value of production (DAFF, 2014). It is comprised of four broad categories – namely, oranges, easy peelers, grapefruit and lemons.

The industry is characterised by a distinct heterogeneity of fruit producers, ranging from large highly commercial producers to resource poorer producers. This fragmentation results in a clear market segmentation (export market, supermarkets, local retailers and local markets) along the farm size groups, with each group serving a certain market (Ndou & Obi, 2011). There are approximately 1400 export-oriented farmers and 2200 small farmers (who supply the local market) spread across the country. These farmers are estimated to employ around 100 000 workers, with a large number of workers in picking and packing houses (Citrus Growers Association, 2013).

The industry is spread across a variety of climatic zones, from a warmer and sub-tropical climate in Mpumalanga, Limpopo and KwaZulu-Natal provinces to Mediterranean climate in the Eastern and Western Cape provinces. This range of climatic conditions provides the ideal environment for growing a full range of citrus fruits. Mpumalanga, Limpopo and KwaZulu-Natal's climates are better suited to the cultivation of grapefruit and Valencia oranges, while the Eastern Cape and Western Cape's climates are suited to the cultivation of navel oranges and lemons.

The industry is well integrated into the global markets and is primarily export-orientated. It has enjoyed export of fruit from the 1900s and is currently the second-largest world exporter of citrus fruit products, after Spain. It generates about US$1.4 billion of foreign exchange through exports, with the United Kingdom (UK) and Europe being the main export markets.

1.2. Statement of the problem

The agricultural sector has undergone huge economic, social and political changes since the beginning of the democratisation process in 1994. It is increasingly integrated into the world markets (Vink *et al*., 2002; Sandrey *et al.*, 2008). The combination of liberalisation and stricter labour laws, brought by the economic transformation, exposed the sector, including the citrus fruit industry, to the adverse effects of globalisation (Chitiga *et al*., 2008). The deregulation of the agricultural sector in 1997 also exposed the citrus producers to the real market forces. One of the greatest challenges was to adapt to the quality demands by the importers. As such, citrus fruit producers in South Africa are facing increasing competition in the domestic and international markets.

The industry's long history of global integration makes it highly sensitive to international developments, as well as domestic ones. As a result, it faces enormous challenges in the global markets, such as an increasing demand for higher quality citrus fruits, as well as increasing fierce competition from the southern hemisphere citrus producing countries. While South Africa dominated southern hemisphere production for much of the post-World War Two period, it now competes with Argentina, Australia, Uruguay, Chile and Peru in the northern hemisphere markets, such as the European Union (the EU). The current trends relating to the trade liberalisation, advances in information technology, consumer preferences and improved logistics are also exerting pressure on the domestic industry to become more competitive.

The EU import tariffs as well as subsidised USA and EU agricultural exports, which according to Groenewald (1998) have put a lot of pressure on some of the Southern African agricultural industries, have eroded the local industry's competiveness in the European market. With global citrus fruit markets becoming more competitive and the local industry largely being deregulated, the domestic industry (one of the least subsidised in the world) is thus consistently challenged to increase its competitiveness if it is to survive in the long run. Its future survival and growth will depend largely on its ability to compete with its southern hemisphere rivals, particularly Argentina, Australia, Uruguay, Chile and Peru for the markets in the traditional as well as potential markets. Being more competitive than these rivals is critical for the long-term survival of the domestic industry. In the light of the above, this study investigates the competitiveness of the domestic industry relative to its rivals in the southern hemisphere region.

1.3. Justification for the study

The competitiveness of the South African citrus fruit industry is critical for the long-term survival of the industry. Due to the changing regulatory and business environments that influence the

way industries operate, research is justified to investigate and compare the relative competitiveness of the domestic industry to its rivals in the southern hemisphere. An analysis of the industry's competitiveness remains paramount amidst the changes in the business environment, particularly those on the market side, like the food safety standards and changes in consumer preferences.

Why do we need to compare the competitiveness of the South African citrus fruit industry with those of Argentina, Australia, Uruguay, Chile and Peru? Firstly, these countries enjoy the same counter-seasonal advantage to access markets in developed countries. Secondly, these countries constitute a major competitive force in South Africa's main traditional export destinations – namely, the EU, the UK, the US and the Far East markets. Thus, a comparison will present a realistic picture of South Africa's future prospects in these markets. A comparative study on the competitiveness between these countries will thus provide valuable information and intelligence in an era when bilateral trade relations are becoming increasingly essential.

1.4. Research objectives and hypothesis

The primary objective of this study is to investigate and compare the competitiveness of the South African citrus fruit industry relative to those of its rivals in the southern hemisphere – namely, Argentina, Australia, Uruguay, Chile and Peru. The specific objectives are:

- to identify the most important South African citrus fruit industry's competitors on the export market, and compare the domestic industry's competitiveness in various aspects of the industry;
- to measure the relative competitiveness of the South Africa's citrus fruit products relative to those of its rivals;
- to identify areas where the South African citrus industry is competitive and where it lacks competitiveness; and
- to determine the factors that influence the competitive success of the domestic industry, thereby identifying major challenges and opportunities for sustained competitiveness.

The research question 'What is the extent of South African citrus fruit industry's competitive status relative to those of southern hemisphere rivals?' needs to be answered. Achievement of the above objectives therefore lies in answering this question.

The hypothesis pertaining to this study is that South Africa reveals a relatively higher and stronger competitive advantage in all citrus fruits – namely, oranges, grapefruit, mandarins,

tangerines and clementines, than its southern hemisphere competitors. Its competitiveness of these products decreases when moving from primary to processed products.

1.5. Delineation

The research will focus on the citrus fruit industry in South Africa and its southern hemisphere competitors – namely, Argentina, Australia, Uruguay, Chile and Peru. The major reason for this delimitation is that these countries are the major producers in the southern hemisphere and are also competing for the same market – namely, the EU, the US and the Far East markets. The researcher believes that the above delimitation will produce typical information effective to be used in creating a framework that will assist the industry to compete efficiently with other southern hemisphere producers.

1.6. Chapter outline

The study is comprised of the following six chapters:

- Chapter **Two** provides a thorough literature on the competitiveness analyses.
- Chapter **Three** provides a descriptive overview of the industry in South Africa, as well as rival countries in the southern hemisphere. This chapter deals with key industry statistics that paint the industry's picture.
- Chapter **Four** presents the approach of the study, outlining the research methodology in detail.
- Chapter **Five** gives the description and interpretation of the research results. It is in this chapter where the revealed competitiveness of the domestic industry is analysed relative to those of its rivals in the southern hemisphere.
- Chapter **Six** gives conclusions and recommendations. This chapter, which serves as the conclusion of the study, identifies and outlines various recommendations and strategies that can be considered by the industry to address all the identified competitiveness-related challenges.

CHAPTER 2: LITERATURE REVIEW

2.1. Introduction

In recent years, competitiveness analysis has become a rapidly evolving area of interest for many agricultural researchers in South Africa. This is evident from an increasing number of studies that have been and are being conducted in this field. The purpose of this chapter is to provide the conceptual framework of the research and to review the literature on agricultural competitiveness analyses by giving a brief summary of studies already done in this field. The definition of comparative advantage and competitiveness, and analysis of the historical development of competitiveness as well as the review of South African agricultural competitiveness analyses will be covered in this chapter.

2.2. Conceptual framework of the research

There are four elements of conceptual framework for this study (see Figure 2.1). First, the study makes use of the Vollrath's (1991) improved original version of the Balassa's Revealed Comparative Advantage (RCA) index (denoted as RCA# to differentiate it from the original RCA) to calculate the competitiveness indexes of various citrus fruit product categories. The RCA# is considered to be a more appropriate measure of competitiveness because a group of countries is expected to have a much greater impact at the world level than an individual economy. It considers the significance of the country's exports in a given sector and at world level, and it eliminates any double counting problems in world trade.

Second, the relative Revealed Comparative Trade Advantage (RTA) index is also used to calculate the competitive advantage of various citrus fruit product categories. The RTA index describes the country's share of the world market pertaining to one commodity relative to its share of all traded goods, and it accounts for imports as well as exports. It obliquely weighs the revealed competitive advantage by calculating the importance of relative export and relative import competitive advantages.

Third, the Net Export index (NX_i index) is also used in this study. The NX_i index does not take into account the overall level of trade in a specific commodity. This implies that a country that is relatively self-sufficient, with a small exportable surplus and no imports, would have an index of 100 and therefore appear to be very competitive, even though it hardly trades at all. For these reasons, Galetto (2003) recommended that both the RCA and NX_i should be used together in assessing and analysing the competitiveness of a specific industry or commodity. Hence, this

study made use of all three indexes to analyse the competitiveness of the South African citrus fruit industry relative to its competitors in the southern hemisphere region.

Finally, this study also made use of the Porter's competitive diamond methodology to gather key success factors and the constraints impacting on the competitiveness of the South African citrus fruit industry. Porter argues (1998) that it is not so much comparative advantage, factor proportions or technology that determine which countries are more competitive in certain industries compared to other countries, but the presence or absence of particular attributes in individual countries that influence industry development. The Porter methodology evaluates the competitiveness of all the different players in the supply chain, as the sample was drawn from citrus fruit farmers, processors, industry labour union and industry associations.

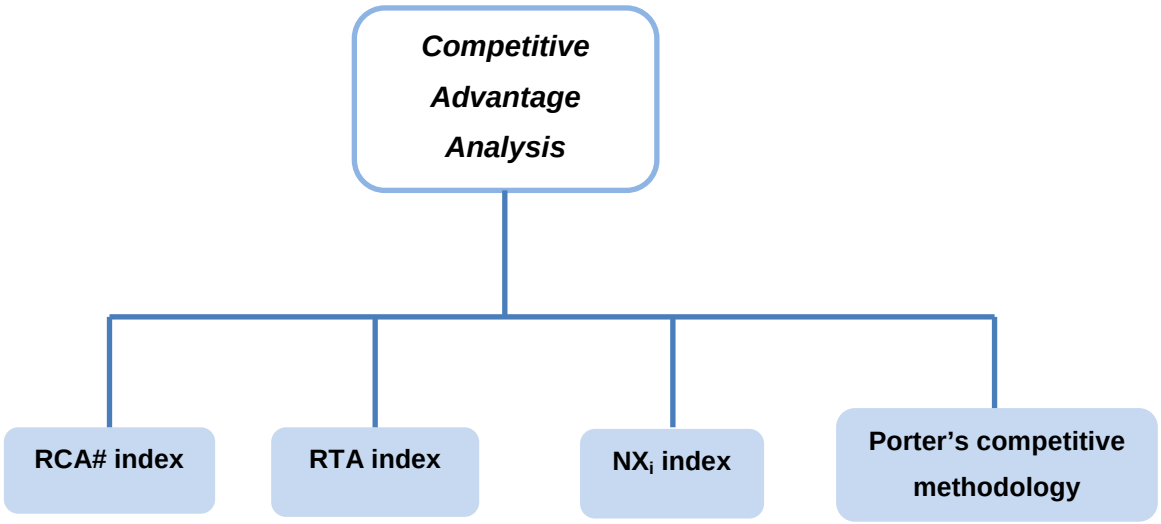

Figure 2.1: A conceptual framework of the research

2.3. Definition of comparative advantage and competitiveness

Comparative advantage and competitiveness are important concepts central to the economic theory. These two concepts are the most important foundations for understanding the importance of international trade, particularly in agriculture, and to clarify the underlying factors responsible for current trade patterns. There is much confusion around the uses of the two terms in economics. The concepts are related, but often wrongly interchanged for each other. It is important to understand the meaning of the two concepts if one wishes to use different measures that are available to measure a country's or industry's competitiveness. It is for this reason that these concepts are discussed in more detail in this section.

The principles of comparative advantage are of the oldest and most important in economics and there is some disagreement in literature about its meaning, scope and measures.

Kannapiran and Fleming (2000) argue that comparative advantage is a concept that applies to inter- and intra-industry comparisons within a country in the traded goods sector but that it is inappropriate for inter-country comparisons. Lipsey *et al.* (1993) define comparative advantage as the ability of one state to produce a commodity at a lesser cost of other products forgone than another nation. Comparative advantage therefore explains how trade could benefit nations by more efficient use of the world's resource base (i.e. land, labour and capital inputs) when that trade is totally unrestricted, i.e. a free market environment or at least when an equal playing field exists. In other words, comparative advantage indicates whether it is economically advantageous to expand the production and trade of a specific commodity.

There are a number of competitive concepts that have been proposed in the economy and business studies and this might be because competitiveness has not been defined thoroughly in the early economic literature. The literature on competitiveness supplies a wide variety of definitions, and there is in fact no single definition of the term in economic literature. The difficulties in defining competitiveness are derived from the various dimensions of this concept. However, some authors have defined competitiveness and it seems their definitions have been widely accepted in economic literature.

Fafchamps *et al.* (1995) define competitiveness as the ability of a firm or country to produce a commodity at an average variable cost below its price. According to Organisation for Economic Co-operation and Development (OECD, 2004), competitiveness is a degree to which a nation can, under free trade and fair market conditions, produce goods and services that meet the test of international market, while simultaneously maintaining and expanding the real income of its people over the long term. Warr (1994) defines competitiveness as an indicator of whether a firm, industry or country could successfully compete in the trade of commodity in the international market, given existing policies and economic structure. Competitiveness is therefore an indicator of the ability to supply goods and services at location in a form and at the time sought after by buyers, at a price that is as good as or better than those of potential suppliers, while earning at least the opportunity costs of returns on resources employed.

In summary, comparative advantage and competitive advantage are different terms that mainly refer to what informs the decision behind the choice of what to produce in a competitive market. Comparative advantage occurs when a company or country can produce something at a relatively cheaper rate than can the competition or other countries. Competitive advantage, on the other hand, occurs when a company or country emerges as a leader in its market sector due to the ability to produce goods or deliver services at higher profits than the competition and at a lower cost to the consumers.

In this study, competitiveness is conceptualised as the ability of the country to produce, trade and exchange citrus fruit products on a sustainable basis at competitive prices within the global environment (Balassa, 1989; Porter, 1990). Thus, citrus fruit product imports and exports will be included in the determination of competitiveness.

2.4. Review of South African agricultural competitiveness analyses

Until recently, there have not been many studies on the competitiveness of agricultural products in South Africa. Competitiveness studies of agricultural products have just gained commercial credence in the last 10 to 20 years, as many agricultural researchers started to realise their importance to the sector. Martinez (1996) argues that this is because of the significant changes currently affecting the agricultural sector, such as the shift in consumer demand, global competition, technological progress and the industrialisation of agriculture.

Competitiveness studies on agricultural products conducted lately on both the micro- and macro-levels include analyses done by Esterhuizen and Van Rooyen (1999), Esterhuizen and Van Rooyen (2001), Van Rooyen (1998), Van Rooyen *et al*. (2000) and Van Rooyen and Esterhuizen (2001). The authors used Balassa's (1989) RCA index method to analyse the competitiveness of several supply chains in the South African agricultural sector. Their findings are that most commodity chains are marginally competitive, and the competitive index generally decreases when moving from primary to processed products. They concluded that their analyses imply that value-adding activities in the domestic agricultural sector are limited. The authors recommended that further research be undertaken into the reasons why supply chains are not competitive, such as lack of technological innovation, unproductive labour, high input costs, poor infrastructure and inappropriate government policy measures.

Kirsten *et al*. (1998) analysed the comparative advantage of commercial wheat production in South Africa using a variant of the Domestic Resource Cost (DRC) methodology. Venter and Horsthemke (1999) analysed the competitiveness of the Southern Africa's sheep meat industry relative to the Australian industry using the Porter's (1990) model. Their findings support studies done before, which clearly argue that the competitiveness of South Africa's agricultural sector decreases downstream. They found that the cost associated with value-adding in the retail industry was much higher in Southern Africa than in Australia.

Blignaut (1999) used an integrated approach suggested by Porter (1985) to study the local and international competitiveness of the South African dairy industry supply chain. He used two types of competitive advantage for his analysis – namely, the cost leadership (i.e. low cost production) and the value-adding (i.e. product differentiation). The latter is considered in terms

of factors such as product safety and quality, marketing approach used and the back-up system. As is the case with other studies, his analysis shows that the competitiveness of the South African dairy industry supply chains decreases downstream.

Gronum *et al*. (2000) investigated comparative advantage of the primary oilseed industry in South Africa using the DRC methodology. Jooste and Van Schalkwyk (2001) and Krabbe and Vink (2000) analysed the comparative advantage of primary dry land soybean production and the sugar industry in South Africa respectively, using the Policy Analysis Matrices (PAMs) devised by Monke and Pearson (1989). The general conclusion from the analyses done by the above researchers is that South Africa has a comparative advantage in the production of certain commodities, however, its competitiveness generally decreases when moving from primary to processed products. Although the analyses of comparative advantage done by these authors using these techniques is quite revealing, certain considerations need to be borne in mind. The underlying problem with the PAM methodology is that it is static in nature and generally focuses on the macro-economic issues and thus fails to shed any information on micro-incentives, as does the DRC methodology.

Mosoma (2004) examined the agricultural competitiveness and supply chain integration of South Africa, Argentina and Australia using the Relative Revealed Comparative Trade Advantage (RTA) index. His analysis demonstrates that South Africa's agricultural food chains are marginally competitive internationally, whereas Argentina's and Australia's agricultural food chains are generally more competitive worldwide than those of South Africa. His findings display that South Africa has managed to move further up the value chain compared to Argentina and Australia. He concludes that in all three countries competitiveness decreases when moving from primary to processed products in the chain, which implies that value-adding opportunities are limited in these countries.

Hallatt (2005) used three indexes, namely, the Revealed Comparative Advantage (RCA#) index, the Net Export Index (NXi) and the Relative Revealed Comparative Trade Advantage (RTA) index to analyse the relative competitiveness of the South African oilseed industry by comparing it with that of Argentina. Her analysis shows that South African groundnuts and sunflower seeds have a competitive advantage in their primary form, but oilseed to which value is added has, in most cases, a competitive disadvantage – exactly the opposite of Argentina's oilseed products. Her study further reveals that the domestic oilseed industry is struggling with comparative and competitive disadvantage for value-added products. These findings led her to analyse the competitiveness of the secondary oilseed industry, and she found that the oilseed industry is price-driven. Her recommendation was that there should be innovations in sunflower

oil production and effective marketing and distribution of service for the industry to gain more competitive advantage.

Mashabela and Vink (2008) used the Relative Revealed Comparative Trade Advantage (RTA) index to measure the competitive performance of South African deciduous fruit supply chains relative to those of Chile. Their findings reveal that the domestic deciduous fruit supply chains are shown to be competitive internationally, whereas Chile's deciduous fruit supply chains are strongly competitive. In most cases, the domestic deciduous fruit products to which value has been added have a competitive disadvantage, contrary to the case in Chile. Their findings further reveal that the domestic industry enjoys a relative global competitive advantage in selling deciduous fruits. However, the competitiveness of the local industry decreases when moving further up the value chain. The authors argue that the major possible explanation for this could be the high rates of return recorded for farm-level applications of technology for most deciduous fruit primary commodities.

Madima (2009) investigated the competitiveness of the South African deciduous fruit canning industry. His findings clearly pointed out that the European Union (EU) subsidies, not Sanitary and Phytosanitary (SPS) conditions, definitely disadvantage the domestic fruit canning industry and negatively affect its competitiveness in the EU market. However, he further found that internationally the local industry is competitive with respect to areas such as labour costs, product quality, efficient production technology, and world class regulatory standards.

Ndou and Obi (2011) analysed the business environment and international competitiveness of South Africa citrus industry using the Constant Market Share (CMS) methodology. Their findings show that South Africa's export growth of lemons and oranges is due to their competitiveness in all exports markets. Though competitive, the domestic industry shows a downward trend in CMS over the years in both lemons and oranges. They further concluded that while SPS standards may rise in the traditional markets, it is easier to comprehend the consumer's need in these targeted markets because of the long standing relationships. They recommended that South Africa should resentfully guard, retain and capitalise upon through delivery of citrus fruit of good quality.

Recently, the Department of Agriculture, Forestry and Fisheries (DAFF, 2011) measured the competitiveness of selected agricultural exports in the European Union (EU) between 2001 and 2009 using the RCA index and Comparative Export Performance (CEP) index approaches. The study reveals that South Africa has been competitive in the EU in terms of fish and crustaceans, vegetables, fruits and beverages, but uncompetitive with regard to cereals, sugar

and tobacco. The study also reveals that Argentinean agricultural exports generally had a comparative advantage over South Africa in the EU market.

It is clear from the preceding discussion that a range of analyses have been conducted on the competitiveness of South Africa's agricultural products. However, none of these studies have compared the competitiveness of citrus fruit products with those of its competitors in the southern hemisphere. Ndou and Obi (2011) only analysed the competitiveness of the citrus fruit industry compared to the major rivals such as Spain, the USA, Turkey, China and Morocco. A study that compares the competitiveness of citrus fruit products relative to those of southern hemisphere competitors is thus justified because such a study will enhance our knowledge of the ability of the South African industry to compete with these countries.

2.5. Summary

The aim of this chapter was to provide a literature review on agriculture competitiveness analyses. The chapter presented a review of several studies that were conducted recently on the competitiveness of various agricultural sub-sectors in South Africa with emphasis on the wide and diverse measures used in these studies. The next chapter will give an overview of the South African citrus fruit industry performance over the years, and compare this to its competitors in the southern hemisphere.

CHAPTER 3: A DESCRIPTIVE OVERVIEW OF THE CITRUS FRUIT INDUSTRY

3.1. Introduction

The purpose of this chapter is to give a descriptive overview of the citrus industry. The chapter starts with the global perspective of the industry, followed by a brief overview of the industry in the southern hemisphere region, before moving to the South African perspective. This will assist in understanding the analysis that is central to this study, as the reader requires some knowledge of the growth of the industry over the past few years to aid in the objective analysis of the industry's competitiveness.

3.2. Global perspective of the citrus fruit industry

3.2.1. Production trend

In 2012, an estimate of just over 131 million tonnes of citrus fruit was produced worldwide. Figure 3.1 below illustrates the trends in citrus fruit production globally over the ten-year period to 2012. Production remained stable, increasing by only an average of 2.4 percent per annum throughout the entire period. This marginal increase was largely underpinned by an increase in the area cultivated to citrus fruits. The area harvested in hectares increased on average by a lower rate of 1.4 percent per annum over the past ten years.

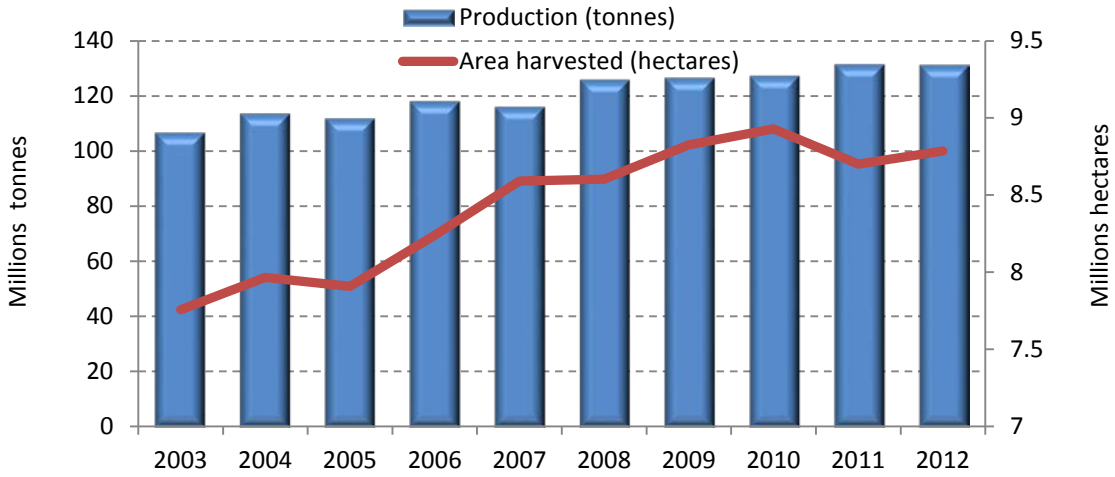

Figure 3.1: Global citrus fruit production

Source: Own calculations based on FAO database (2014)

Citrus fruit production can be divided among four primary groups – namely, oranges; tangerines, mandarins and clementines; grapefruit; and lemons and limes. Figure 3.2 illustrates the major citrus fruit produced around the world. Oranges account for over half of the total

global citrus production. In 2012, over 68.2 million tonnes of oranges were produced worldwide, particularly in Brazil and the USA (California and Florida). Tangerines and mandarins are the second largest produced, accounting for 20.6 percent of the total world citrus production, followed by lemons and limes at 11.5 percent. Grapefruit is the least produced, with only just over 8 million tonnes produced in 2012.

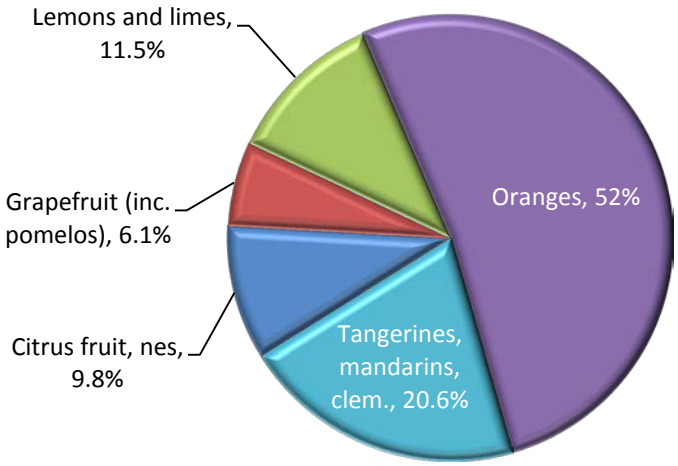

Figure 3.2: Major citrus fruit produced, 2012

Source: Own calculations based on FAO database (2014)

Citrus fruit production takes place throughout the tropical and sub-tropical countries of the world. Figure 3.3 illustrates the major citrus fruit producing countries around the world in 2012. Citrus fruit production is geographically concentrated, with production mostly concentrated in the northern hemisphere region. China is by far the leading producer of citrus fruits, mostly dominated by tangerines and mandarins, as well as lemons and limes. It accounts for 24.1 percent of the total world's citrus fruits production, followed by Brazil (which is a major producer of oranges) with a 15.4 percent share. Other key producing countries include the USA, India and Mexico. South Africa produces just over 2.3 million tonnes of citrus fruits, which ranks it thirteenth in the world citrus production in 2012.

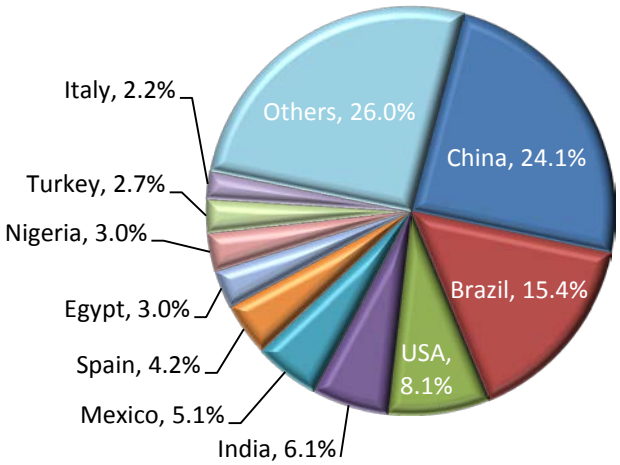

Figure 3.3: Major citrus fruit producing countries, 2012

Source: Own calculations based on FAO database (2014)

3.2.2. Trade trends

Figure 3.4 illustrates export value trends of different citrus fruits exports worldwide over the ten-year period to 2012. There has been an increase in export values for all citrus fruit categories between 2003 and 2012, with grapefruit being the least exported citrus fruit in the world, as is the case with production. Mandarins, tangerines and clementines export values declined slightly by 3 percent in 2006 largely due to the declining demand from major importing countries, such as the USA, Germany, Poland and Italy. Oranges remain the most exported citrus fruit, accounting for 40 percent of the total global citrus export value. Though there was recently a slight decline in 2012, orange export values continued to increase throughout the entire period, as depicted in Figure 3.4.

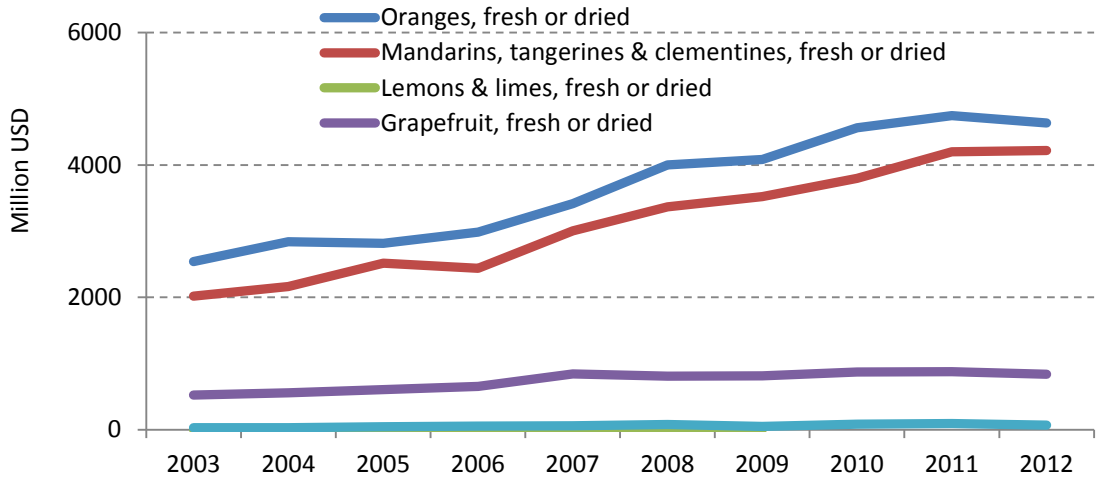

Figure 3.4: Global citrus fruit exports

Source: Own calculations based on ITC database (2014)

3.2.3. Major trading countries

Figure 3.5 shows the top citrus fruit trading partners around the world. Spain, which mostly exports mandarins, tangerines and oranges, is the top exporter of citrus fruit products. It accounts for 29.6 percent of the total citrus fruit exported across the globe, followed by the USA with a share of 8.8 percent. The citrus fruit export market is highly concentrated, with the top ten exporters accounting for over 79 percent, with other countries taking the remaining share.

The demand side of the world citrus fruit market is comparatively fragmented, with the top ten major importers accounting for 58 percent of overall global imports. The Russian Federation is by far the largest importer (mostly of mandarins and tangerines, as well as oranges) with a share of 11.9 percent, followed closely by France, Germany and Netherlands with a share of 8.3 percent, 7.8 percent and 7.3 percent respectively.

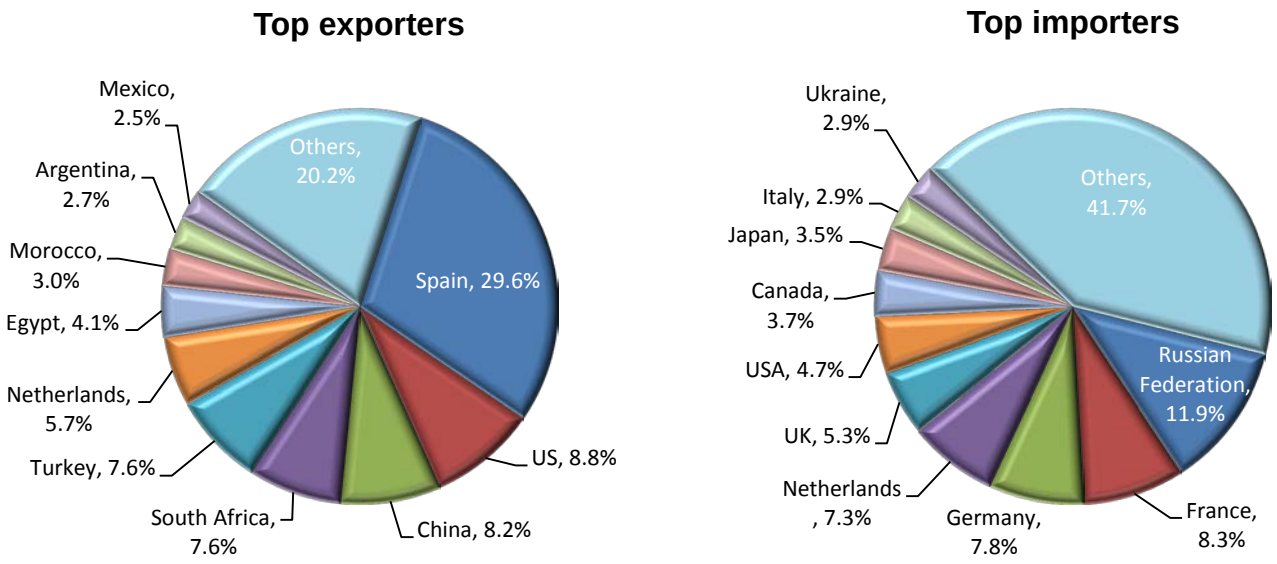

Figure 3.5: Top citrus fruit (fresh or dried) trading partners in values, 2012

Source: Own calculations based on ITC database (2014)

3.3. The southern hemisphere perspective of citrus fruit industry

This section gives a background to the South African citrus fruit industry's competitors in the southern hemisphere region. It analyses the production and trade trends, as this will help in determining which countries in the region constitute a competitive threat to the domestic industry.

3.3.1. Production trends

Figure 3.6 illustrates the trends in citrus fruit production in the southern hemisphere over the ten-year period to 2012. Australia, which produces mostly oranges, is the major producing country among South Africa's competitors in the southern hemisphere. Its production decline in 2007 and 2010 was largely underpinned by a substantial decline in the area planted to citrus fruits.

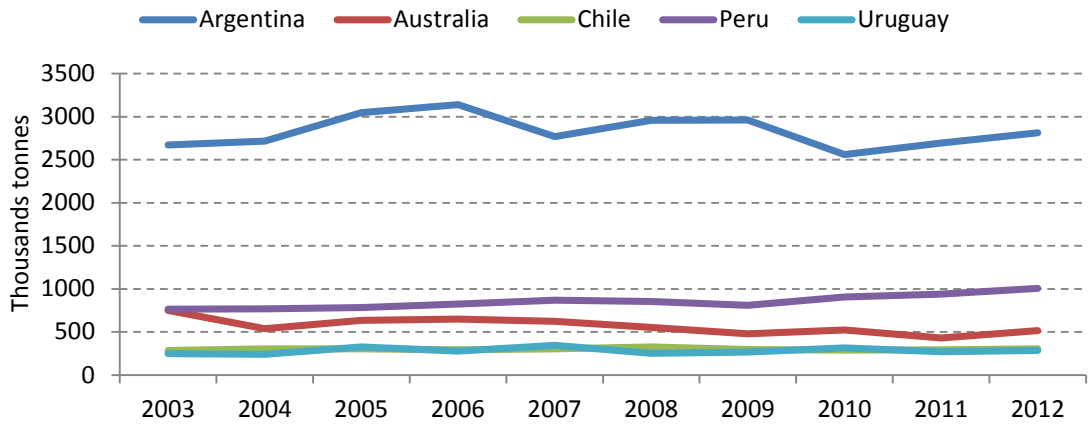

Figure 3.6: Citrus fruit production trends of South Africa's competitors in the southern hemisphere

Source: Own calculations based on FAO database (2013)

3.3.2. Trade trends

Figure 3.7 illustrates the trends of South Africa's citrus fruit industry's competitors in the southern hemisphere over the ten-year period to 2012. Argentina is by far the largest exporter among these countries, mostly of lemons (fresh or dried) to the Netherlands, the Russian Federation, Spain and Italy. It is followed by Australia, which exports mostly oranges to Japan, Hong Kong, China and the USA.

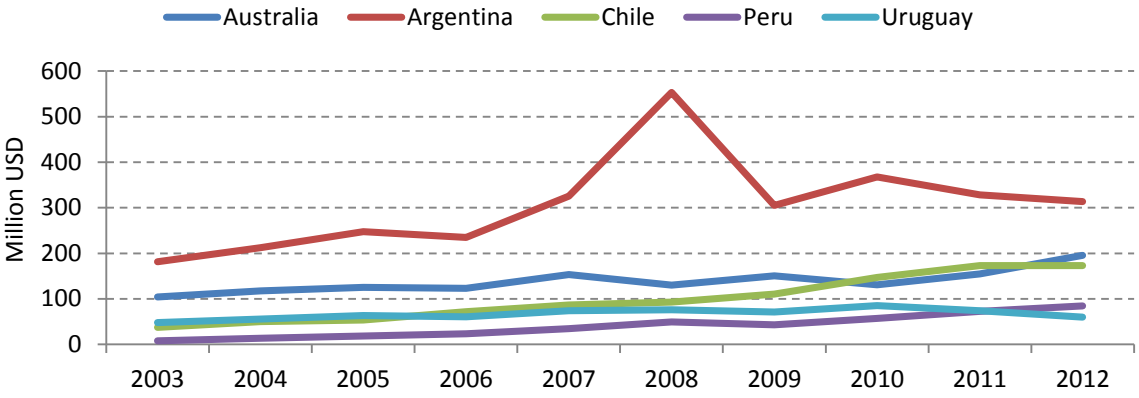

Figure 3.7: Citrus fruits exports from major southern hemisphere countries

Source: Own calculations based on ITC database (2013)

3.4. The South African perspective of citrus fruit industry

3.4.1. The industry's contribution to the South African economy

The citrus fruit industry is an important contributor to the South African economy. In terms of gross value, it is the third largest horticultural industry after the deciduous fruits and vegetables industries. During the 2011/12 production season, the citrus fruit industry contributed R7.7 billion (4.7 percent) to the total gross value of South African agricultural production (DAFF, 2014). The industry is a significant foreign currency earner and this contributes considerably to the country's GDP. Export of citrus fruit is an important component of the South African agricultural exports, which contribute on average around 27 percent of the total agricultural exports.

Though there has been some significant reduction in employment since the deregulation of the whole fruit sector in 1996, the citrus fruit industry is still a significant employer, especially during peak periods such as harvesting. It is labour intensive and employs approximately 100 000 permanent farm workers, with large numbers of workers in picking and packing houses. The figure for seasonal farm workers employed by citrus farms is unknown, as the organisation of farm workers has been proved extremely difficult in South Africa (Mather, 1999). An unspecified number of people are also employed throughout the supply chain services, such as transport, port handling and related services. It is therefore estimated that over a million households depend on the citrus fruit industry (DAFF, 2011).

3.4.2. Major key players in the industry

There was a major change in the citrus industry as a result of the deregulation process in 1996, which was driven by anti-competition philosophies and concern about effective use of power in the single-channel marketing system. Several representative organisations were formed in the mid-1990s to represent citrus fruit producers. Figure 3.6 illustrates the South African citrus fruit industry coordination mechanisms and support structures, with the link to the related and supporting industries either being direct or indirect.

The industry is organised around the commercial and the smallholder producers who are members and non-members of the Citrus Growers Association of Southern Africa (CGA). The CGA is an umbrella organisation formed in 1997 as the principal citrus industry organisation. It is the main body representing the industry's stakeholder interests to the exporters, research institutions, government and suppliers to the industry. It provides membership to approximately 1400 citrus growers throughout South Africa, Zimbabwe and Swaziland (CGA, 2010a). Its main

aims are to facilitate market access for growers and producers (particularly in the USA, the EU and South East Asia); to ensure the industry provides citrus fruit to the required standard for these markets (especially from a food safety and phytosanitary perspective); to support research in the industry (i.e. determining grower research priorities, directing research effort and controlling research expenditure); to transform the industry (i.e. the inclusion of previously disadvantaged indigenous communities in the industry); and to communicate to industry players to ensure that members are kept abreast of issues affecting the industry.

Some of the key organisations supporting the industry are learning institutions, Fresh Produce Exporters Forum (FPEF), Citrus Research International (CRI), Agricultural Research Council (ARC), the Citrus Academy, the Perishable Products Exporters Control Board (PPECB), and the Department of Agriculture, Forestry and Fisheries (DAFF). The CRI is the CGA's research wing and is responsible for managing technical and research services to the domestic industry. Its aim is to maximise the long-term competitiveness of the Southern African citrus growers through the development, support, coordination and provision of research and technical services (Philp, 2006). The core functions of the CRI are cultivar evaluation (cultivars, rootstocks and acquisition of varieties) and disease management, including soil borne diseases, graft transmissible diseases, Citrus Black Spot, fruit and foliar diseases, post-harvest pathology. It is responsible for the coordination of funding distribution for the support of identified research proposals, crop load and fruit quality management (fruit production and quality, rind condition) and integrated pest management (bio-control interference, cosmetic pests, false codling moth, fruit flies, mealy bug and other phytosanitary pests, and production pests).

The CRI's board consists of eleven citrus industry stakeholders – namely, six grower representatives, one representative each from the University of Pretoria and the University of Stellenbosch, a citrus consultant, a representative from the ARC and the citrus exporter. The Universities of Stellenbosch and Pretoria provide university-linked research for the industry, and both institutions have a membership in the CRI Board (Philp, 2006). The ARC specialises in the breeding of new varieties and houses the citrus quarantine station. The PPECB provides food safety, quality and assurance services to promote and instil confidence in the agricultural products of South Africa that are internationally preferred (DAFF, 2011).

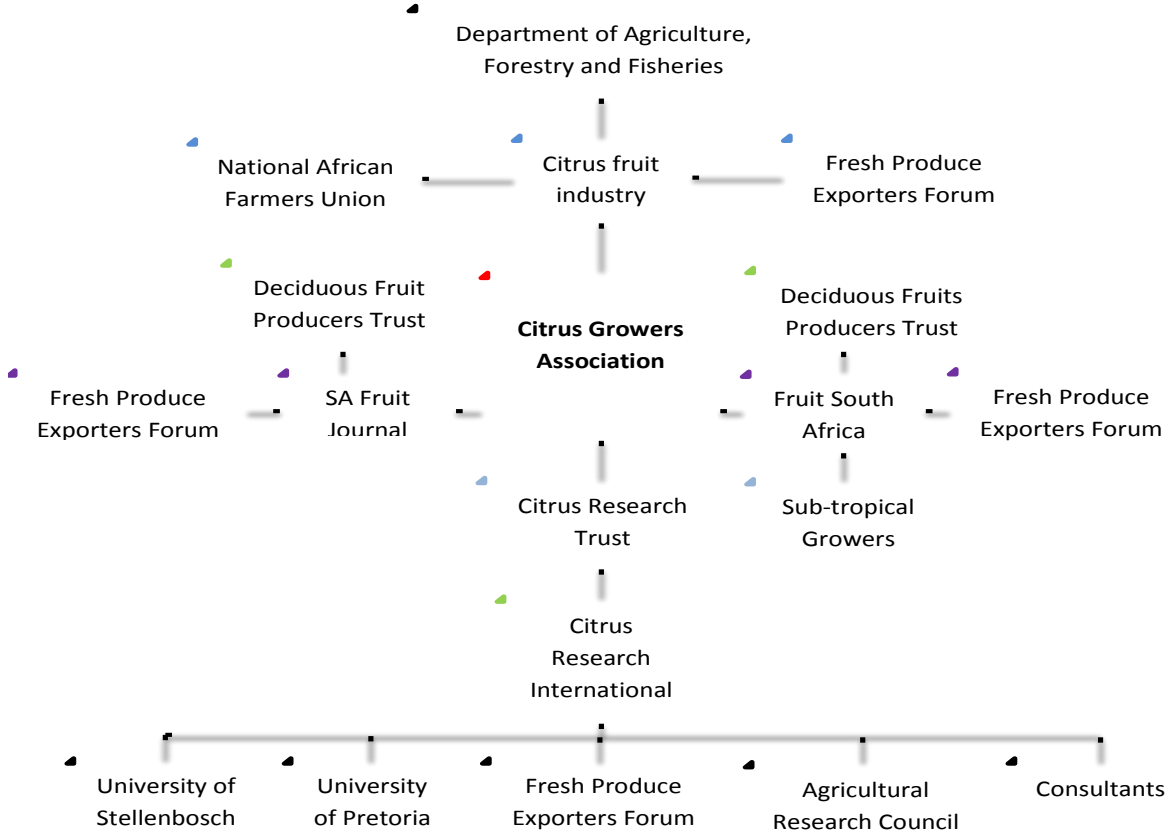

Figure 3.8: The South African citrus industry coordination mechanisms and support structures

Source: Adapted from Philp (2006)

3.4.3. Production trends

The South African citrus industry is characterised by distinct heterogeneity of the citrus fruit producers, ranging from large, highly commercial growers to resource poorer small-scale growers. This fragmentation results in a clear market segmentation (export market, supermarkets, local retailers, and local markets) along the farm size groups. It is estimated that there are around 2200 small farmers that supply the local market.

Production of citrus fruits in South Africa comprises four broad categories – namely, oranges, soft citrus (clementines, satsumas, mandarins and naartjies), grapefruit as well as lemons and limes. Figure 3.9 illustrates the domestic citrus fruit production trends over the past ten years to 2012. Orange production has been on the increase since 2004 production season mainly due to good climatic conditions in leading production areas. Although there were some areas in the Eastern Cape and Western Cape that experienced some severe droughts and were exposed to severe floods around these periods, this did not have a serious impact on the total production

because other regions produced more than expected. In the 2009 production year, oranges experienced a steep decline in production compared to other citrus fruits. This could be attributed to the reduction in hectares planted to citrus fruit tree during this period, especially in the Eastern Cape and North West province.

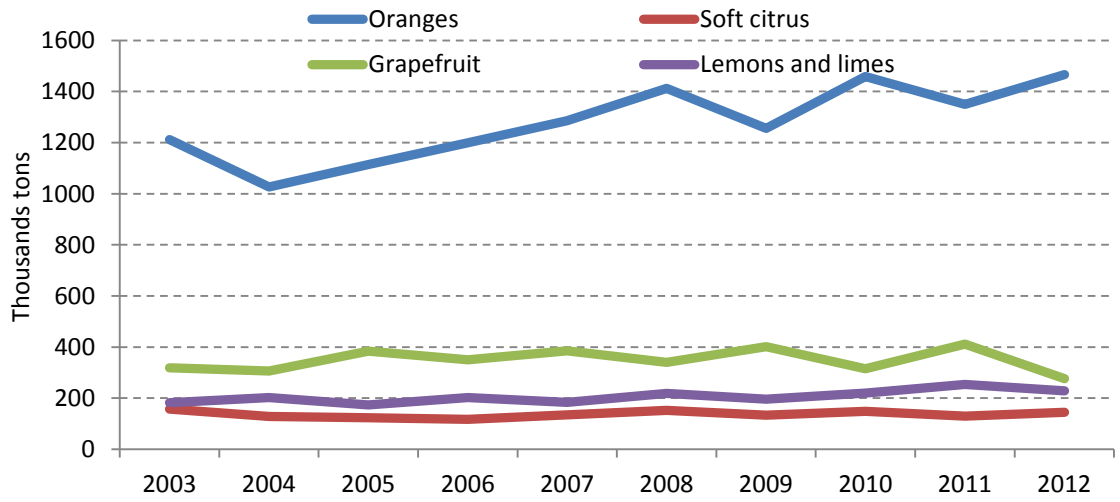

Figure 3.9: South Africa citrus fruit production trends

Source: CGA database (2013)

Production of citrus fruits in South Africa is confined to specific climatic regions. Figure 3.10 illustrates the active growing areas of several fruits in South Africa. The most active citrus fruits production areas are Limpopo, Eastern Cape, Western Cape and Mpumalanga provinces. Limpopo Province has the greatest hectares under citrus trees, followed by Eastern Cape, Western Cape and Mpumalanga provinces. Smaller portions are also grown in KwaZulu-Natal and the Northern Cape Province.

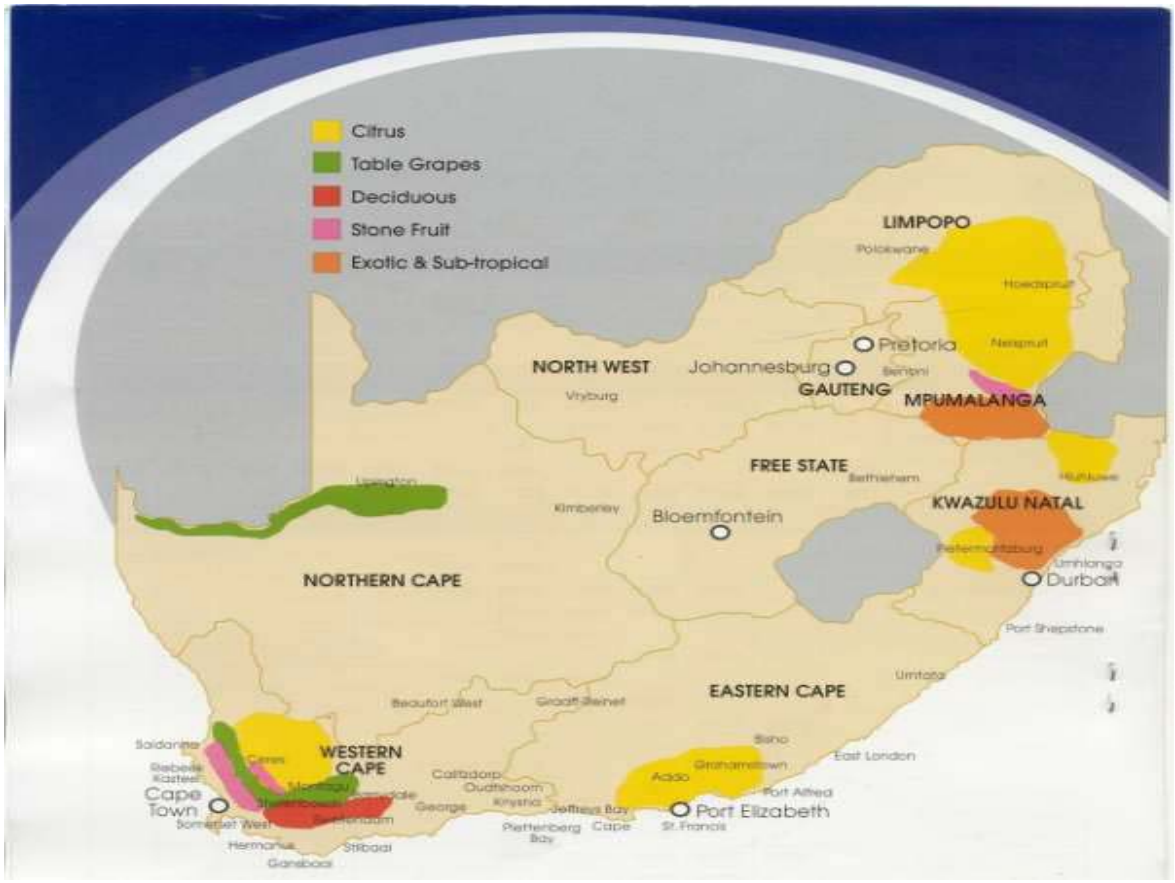

Figure 3.10: Map of South Africa showing citrus growing areas

Source: Adapted from the CGA portal (2013)

There are 60 487 hectares planted area of citrus trees in South Africa producing 2.1 million tonnes. Figure 3.11 depicts the percentage of the major producing provinces. It is evident that the most citrus fruits production takes place in the Limpopo Province, as it has the greatest hectares under citrus fruit trees. It contributes 39.3 percent of the total area planted to citrus in South Africa, followed by the Eastern Cape Province with a 23.1 percent share. Mpumalanga and Western Cape provinces account for 15.1 percent and 14.8 percent respectively. A smaller percentage (2.3 percent) is cultivated in the Northern Cape.

Mpumalanga, Limpopo and KwaZulu-Natal climates are warmer and better suited to the cultivation of grapefruit and Valencia oranges. The Western Cape and Eastern Cape provinces, on the other hand, are considered to be 'cooler' citrus growing areas and production is focused on navel oranges, lemons and soft citrus fruits.

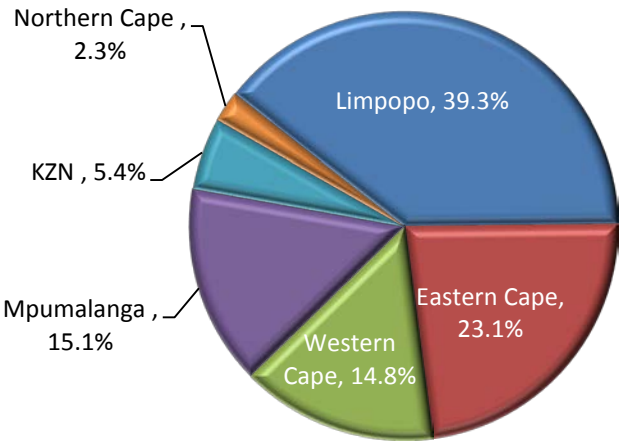

Figure 3.11: South Africa's citrus producing regions in hectares, 2012

Source: Own calculation based on CGA database (2013)

3.4.4. Distribution of South African citrus production

Figure 3.12 illustrates the distribution of total citrus fruit production among different market segments. The largest portion is normally destined for the export market, with over two thirds of production, followed by the processing segment (22 percent) of the industry. The local market takes, on average, a small share of 7 percent of total production.

Compared to other citrus fruit, most citrus fruits destined to processing industries are oranges (65 percent), which are converted into orange juice and can be presented in different forms, such as frozen, concentrate and freshly-squeezed. They are followed by grapefruits, which account for 20 percent of the total citrus fruits destined for the processing industry.

Figure 3.12: Distribution of South African orange production

Source: Own calculations based on CGA database (2013)

3.4.5. Trade trends

The South African citrus fruit industry is an export-driven industry, with most citrus fruit produced mainly aimed at the export market. It has gained a reputation globally as the most reliable supplier of citrus fruit products. The industry has made efforts to keep the export market supplied with fruits amidst changes in both the domestic and international environments. Though there have been challenges with the rejection of citrus fruits from South Africa by some markets – such as the USA and South Korea – citing safety and quality problems, the situation has been improving over years.

It is estimated that 71 percent of the total citrus production is exported. Although South Africa produces only 1.8 percent and ranks thirteenth in the production of citrus fruits in the world, it is the second largest exporter of citrus (in volumes) after Spain. It exported just under 1.5 million tonnes of fresh citrus fruits in 2012, distributed 1.04 million tonnes of oranges, 114.6 thousand tonnes of soft citrus, 181.2 thousand tonnes of grapefruit and 157.7 thousand tonnes of lemons and limes (CGA, 2013). Figure 3.13 depicts the historical export volumes over the last ten years to 2012. Orange exports tapered off in 2004 and 2009, with the profitability of exporters coming under pressure.

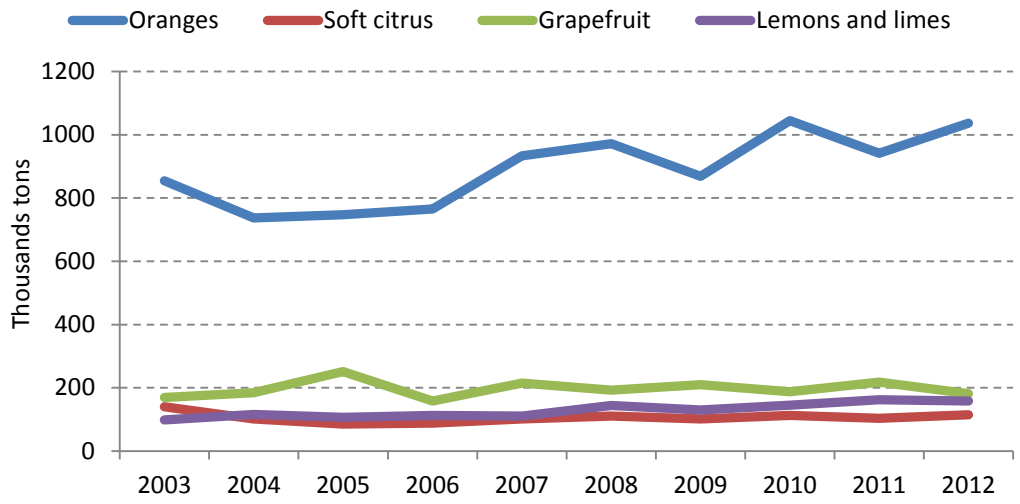

Figure 3.13: South African citrus fruit export trends

Source: CGA database (2013)

Figure 3.14 shows the key export markets for South Africa's citrus fruits exports. Most citrus fruits are destined to the northern hemisphere region. They are well received in this region largely due to the historical excellent quality and the opposite season. Northern Europe is by far the largest market, absorbing 23 percent of the domestic total citrus fruit exports. Other key

export markets include the Middle East (the fastest growing market), Russia, the Far East and the UK.

Argentina is the main competitor in most of South Africa's important export destinations with regard to lemon and soft citrus. Although South Africa takes the lead in oranges and grapefruits, Argentina has a significant impact especially on the eastern European export market. Chile is the competitor of soft citrus and oranges in the US market, which takes around 3 percent of the total citrus exports from South Africa. Australia, which has quality advantage, is the significant competitor for the US orange market and for certain markets in the Far East (Mabiletsa, 2006). South Africa's adoption of new popular varieties and its improvement in management processes to ensure high quality fruit has made it to positively thrive amidst competition from these competing countries in the export markets (Freshfruit, 2013).

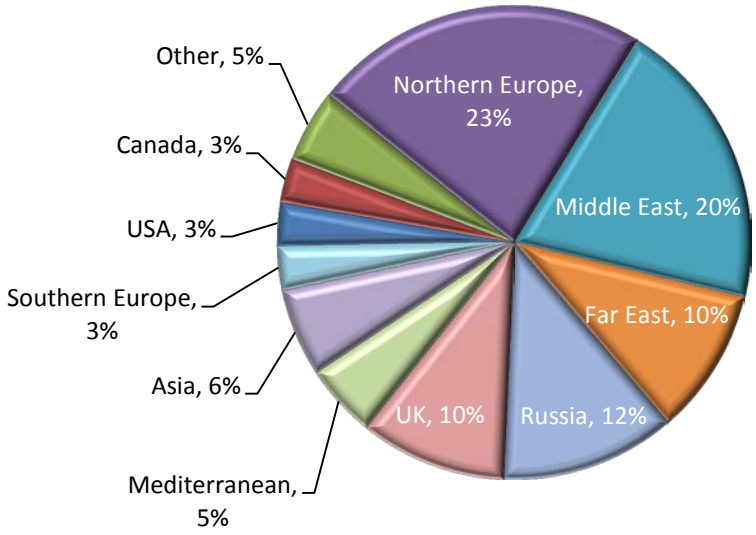

Figure 3.14: Leading markets for South Africa's citrus fruits exports, 2012

Source: Own calculations based on CGA database (2013)

3.4.6. Constraints and challenges facing the domestic industry

Despite the enduring history, the South African citrus fruit industry still faces challenges with a complexity and intensity that cannot be detached from the ever-changing business environment. The main challenges faced by the industry are categorised into the export market-related challenges and those challenges from the production side. The export market-related challenges involve the foreign market support regimes for citrus fruit growers in the developed countries. This entails all the efforts by governments in these countries to protect or support their own growers from the intense competition associated with free trade. Tariffs and non-tariff barriers in the form of the minimum import price system are two of the most common

forms of support, and these pose a threat to the performance of the domestic industry in the global market. As a result, the industry faces unfair international trading practices, including subsidies given to farmers in rival countries.

The production side challenges are mainly dominated by transport problems. The industry, especially in the northern region production areas, is faced with a lack of efficient transportation from the pack-houses to the markets, whether considering road, rail or maritime transportation. The transport problem faced by the industry is worsened by the challenges of congestion at the Durban port, with trucks taking long hours at the port. Thus, transport operators charge high premiums for citrus exporters, making road transport to the port very expensive (CGA, 2011). Plans to consider rail as an alternative to road transport may help alleviate the problem.

Other challenges include, amongst others, the instability of citrus fruit prices; a lack of appropriate technology (such as sorting and grading equipment); diseases, such as the Citrus Black Spot (CBS) which continues to affect the exports; crime, which is a major concern for farmers; the high incidence and prevalence of HIV/Aids, which undoubtedly affects the availability of labour; and the high and increasing input costs (e.g. electricity, pesticides and labour).

3.4.7. The SWOT analysis of the South African citrus fruit industry

Table 3.1 reflects the strengths, weaknesses, threats and opportunities (SWOT) analysis of the South African citrus industry. The strengths and weaknesses are largely of internal origin (i.e. specific characteristics of the industry) and are either helpful or harmful in achieving the industry's competitiveness. Opportunities and threats, on the other hand, are generally external attributes of the environment, both domestically and globally.

Table 3.1: The SWOT analysis of the South African citrus fruit industry

Strengths	Weaknesses
• Established leading player in the export markets. • Known for excellent overall quality of citrus fruits (i.e. strong reputation in major international markets). • The geographic position in relation to most of the international markets, with significantly shorter shipping times than its rivals. • Excellent world class infrastructure, including readily available air, deep water ports, and well-	• Deteriorating research infrastructure and capacity, which may limit new technology development in future. • Saturation of traditional export markets. • Over-reliance of the UK and EU as main export markets. • Delays due to the degradation of the supporting infrastructure within the supply chain (i.e. harbour congestion and roads).

developed cold chain facilities. • Sound communication mechanisms to the majority of industry participants. • High level of investment in current technology in pack houses and cold chain facilities. • The industry has all traceability systems in place, as required by accreditation protocols.	• Very high transport costs, especially rail to ports (primarily Durban). • Labour inefficiency (e.g. it is estimated that a job done by one person in Australia takes around three to four people in South Africa to do (Philp, 2006). • An element of fragmentation in the industry. • Lack of control on efficiency and productivity in the supply chain beyond farm gate and pack-house door. • Poor skills and knowledge of the new entrants.
Opportunities	**Threats**
• Counter-seasonality of production to the northern hemisphere rivals. • The fast growing emerging markets and market access initiatives to these markets (e.g. Japan, Middle East, Asia and China). • Increasing demand due to consumers opting for healthy diets. • Potential for increased local market consumption. • Harmonisation of the institutional environment.	• Increased competition from the southern hemisphere counterparts, such as Chile, Brazil and Argentina. • Availability and cost of irrigation water. • Impact of climate change, especially in the Western and Eastern Cape provinces. • Inflation rates with regard to costs of labour and farming and also packing prerequisites. • High crime rates linked to farm attacks.

Source: Adapted from DAFF (2011)

3.5. Summary

The main aim of this chapter was to provide a descriptive overview of the citrus fruit in the world, southern hemisphere and South Africa, with special emphasis on the contribution to the economy as well as production and trade trends. The citrus fruit industry is very important to the South African economy, its growth and developmental potential. It plays a vital role in job creation, and is a significant foreign currency earner and this contributes considerably to the country's GDP. It has continued to thrive in the international market over the decades, despite the challenges it faces in its traditional export markets. It has managed to cope with competition and challenges to some degree. The next chapter provides a description of the research methodology in details that were used in the subsequent chapter to analyse the competitiveness of the domestic citrus industry relative to those of its competitors in the southern hemisphere.

CHAPTER 4: METHODOLOGY AND MODEL SPECIFICATION

4.1. Introduction

This chapter focuses on the research methodology and model specification. It discusses the framework of analysing the competitiveness. Its purpose is to describe the research methodology and explain the techniques or indexes used in the next chapter to measure the competitiveness of the domestic citrus fruit industry relative to its southern hemisphere competitors.

4.2. Study areas

The study focused on the citrus industry in South Africa as well as its southern hemisphere rivals – namely, Argentina, Australia, Uruguay, Chile and Peru. However, special focus in terms of constraints that continue to negatively impact the competitiveness of the industry was only based on the domestic industry.

4.3. Sampling frame

To unravel the reasons behind the competitiveness and/or lack of competitiveness in the domestic industry, a perceptions survey was conducted using a structured questionnaire. Stratified random sampling of available and willing industry leaders was undertaken in the main citrus fruit producing areas of Mpumalanga, Limpopo, KwaZulu-Natal, Eastern Cape and Western Cape provinces. Sampling is useful if the population size is large and if both the cost and time which are associated with obtaining information from the population are high. The respondents were asked to complete a questionnaire and answer questions related to the competiveness of the domestic industry. An Excel spreadsheet was set up for the capturing of data from different respondents.

4.4. Data

The research methodology used in this study closely resembled that of a cluster study. This research used a mixed methods approach in that the data collection consisted of both qualitative and quantitative approaches. This method of data collection recognises that there are weaknesses inherent in each type of data. By combining both the quantitative and qualitative data, the researcher can neutralise the weaknesses involved in each single method of data collection (Creswell, 2003). Another advantage of the mixed methods approach is that results from one method can help develop or inform the other method. Mixed methods allow the research to be conducted using both open- and closed-ended questions. Also, multiple forms of data are collected and statistical and text analyses can be performed. By combining

these methods, the researcher can provide a comprehensive analysis of the research problem (Creswell, 2003).

The study made use of both the primary and secondary data. The primary data were obtained from the citrus fruit producers, processors and other industries' stakeholders by means of interviews and questionnaires. An array of expert views was gathered through interviews with key industry stakeholders. The research sample consisted of 80 companies involved in the citrus fruit industry in South Africa. An Excel spreadsheet was developed for the capturing of data from different respondents.

The study also made use of Porter's competitive diamond methodology to gather key success factors and constraints that continue to impact negatively on the competitiveness of the South African citrus fruit industry. The Porter model evaluates the competitiveness of all the different players on the supply chain as the sample is drawn from citrus fruit farmers, processors, industry labour union and industry associations. The advantage of the Porter's diamond model is that it evaluates all participants in the value chain (Porter, 1990; 1998). While the approach points out the weaknesses and strengths of the sector, it also identifies critical success factors in the value chain to which special attention can be given with the objective of developing and sustaining the competitiveness as successfully as possible in years to come.

For the analysis and competitiveness calculations, considerable use was made of the secondary data already generated, including data from a reputable organisation such as the Food and Agricultural Organisation of the United Nations (FAO), the International Trade Centre (ITC) trade map, and the United Nations (UN) Commodity Trade Statistics database. The time series data on citrus fruit imports and exports were used to calculate the competitive indexes using the Vollrath's (1991) improved original version of the Balassa's Revealed Comparative Advantage (RCA) index, the Relative Revealed Comparative Trade Advantage (RTA) index and the Net Export index (NX_i) (see section 4.6 for more information about these indexes).

4.5. Data collection instrument and procedure

Different methods were used to collect data. Data were collected by the use of a questionnaire, conducting interviews, and in some cases it was collected telephonically. Structured questionnaires were used to obtain qualitative and quantitative data from a sample of 80 industry stakeholders, such as citrus fruit producers and processors. The questionnaire was developed in such a way that it provided answers that enabled the researcher to address the research objectives and research question.

Apart from the questionnaire, interviews were also conducted to collect information. The researcher used in-depth interviews to gather information about the competitiveness of the industry from, amongst others, industry associations, producers and processors. An in-depth interview is a qualitative research technique that allows person-to-person discussion. It can lead to increased insight into people's thoughts, feelings and behaviour on important issues. This type of interview is often unstructured and therefore permits the interviewer to encourage an informant (respondent) to talk at length about the topic of interest.

Telephonic interviews were also used to collect data from the citrus fruit growers and processors who could not have time to fill in the questionnaire and those who were located in remote areas. This certainly reduced the transport costs. During telephonic interviews, similar questions were used as in the questionnaire to obtain information from the respondents.

A total of 80 (sample size) questionnaires were sent to different organisations, including producers, processors, industry experts and exporters. Only 32 questionnaires were returned, representing an acceptable response rate of 40 percent. This sample size was representative enough to draw somehow precise findings and conclusions on the study.

4.6. Techniques and indexes to measure competitiveness

The measurement of the concept of competitiveness is a controversial issue due to its complexity. It means quite a lot of different things to different people with different interests. Measuring the competitiveness greatly differs according to the level of analysis, i.e. at firm, sector and overall economy levels. The complexity of the competitiveness concept has seen many measures thrown into the research field. As a result, there are many diverse methods and indexes that have been developed to measure the comparative and competitive advantage, such as the Revealed Comparative Advantage (RCA), the Domestic Resource Cost (DRC), the Policy Analysis Matrix (PAM), the Net Social Profitability (NSP), the Resource Cost Ratio (RCR) and the Trade Performance Index (TPI) (Esterhuizen & Van Rooyen, 1999).

Turner and Van't Dack (1993) and Ferto and Hubbard (2002) argue that no single comprehensive measure can be regarded as the appropriate indicator of the comparative and the competitive advantage. This is witnessed by the failure of scholars to come to a conclusive definition of the concept, the basis of comparison and the number of dimensions included in the determination of competitiveness (Esterhuizen *et al*., 2001). Therefore, the choice of measurement is influenced by a particular question or facet of competitiveness that one wishes to deal with. Thus, linked to the choice of the methodology is the way the concept is defined.

In the context of the objectives of this study, the three internationally recognised techniques – namely, the Vollrath (1991)'s improved original version of the Balassa's Revealed Comparative Advantage (RCA) index (denoted as the RCA# to differentiate it from the original RCA), the Relative Revealed Comparative Trade Advantage (RTA) index and the Net Export index (NXi) – were used to measure the competitiveness of South African citrus fruit industry relative to its southern hemisphere competitors. These indexes are common to determine the competitiveness at sector level where trends and countries are compared in the international market (Banterle & Carraresi, 2007). They are discussed below, together with the Porter's competitive diamond model.

4.6.1. Revealed Comparative Advantage (RCA) index

According to Galleto (2003) and Winkelman *et al*. (1995), the Revealed Comparative Advantage (RCA) index is one of the most popular and potent measures of the industrial competitive performance. It has a long history of practical use and has gained greater acceptance among the applied trade economists. Hinloopen and Marrewijk (2001) argue that the use of the RCA index for identifying a country's weak and strong sectors is widespread, both among the academic scholars and the policy makers. It is widely used in practice to determine the country's weak and strong sectors.

Lieser (1958) was the first to utilise the RCA index as proxies for comparative costs in an effort to assess the potential effects on British industry of an entry into the European common markets, before it was refined and popularised by Balassa (1965). For a particular country, Balassa (1965) defines the RCA of a product as the ratio of the share of that product in world trade. It is an ex-post measure of competitiveness and compares a country's share of the world market in one commodity relative to its share of all traded goods. It measures a nation's exports of a product or service relative to its overall exports and to the corresponding export performance of a set of countries (Ferto & Hubbard, 2002). Given a group of reference countries, the Balassa RCA index basically measures normalised export shares, where the normalisation is with respect to exports of the same industry in the group of reference countries. In particular, if X_{Aj} is country A's export value of industry j, X_{refj} is industry j's export value relative to the group of reference countries, and we define $X_i = \Sigma j X_{ij}$ for i=A, ref, then country A's Balassa RCA index for industry j, i.e. RCA_{Aj}, equals:

$$RCA_{Aj} = (X_{Aj}/X_A)/(X_{refj}/X_{ref})$$

If the index takes a value greater than one, the country is considered to have a revealed comparative advantage in the product while a value below one indicates a comparative disadvantage. In other words, if RCA_{Aj} exceeds 1, country A is said to have a comparative advantage in industry j, since this industry is more important for country A's exports than the exports of the reference countries.

The advantage of Balassa's RCA index is that the only data required are trade statistics. The quality of the results is thus to a considerable extent dependent on the quality of available data for analysis. However, the index has some measurement problems, as it is defined in terms of autarkic price relationships that are not observable (Bender & Li, 2002; Batha & Jooste, 2004). This index assumes that the true pattern of competitive advantage can be observed from post-trade data, and trade statistics reflect only post-trade situations. The real (observed) trade patterns may be distorted by government interventions, thus causing misrepresentation of underlying competitive advantage. It is thus a concern that import restrictions, export subsidies and other protectionist policies of governments, to an extent, may distort RCA indices. Despite this, Bender and Li (2002) and Batha and Jooste (2004) are of the opinion that the RCA index is still acceptable, since the impact of changes in trade policies can be deducted from movements of the RCA, even though it fails to distinguish between a region's factor endowments.

Since first suggested by Balassa (1965), the definition of RCA has been revised and modified so that an excessive number of measures now exist. Vollrath (1991) improved the version of Balassa's RCA index to reflect both imports and exports. According to Bender and Li (2002) as well as Batha and Jooste (2004), the Vollrath's (1991) RCA index, which is denoted by RCA# for the purpose of differentiating it from Balassa's original RCA, is considered to be a more appropriate measure of competitiveness because a group of countries is expected to have a much greater impact at the world level than an individual economy. The RCA# index considers the significance of the country's exports in a given sector and at the world level. It eliminates any double counting problems in world trade.

Vollrath's (1991) RCA# is expressed mathematically as:

$$RCA\#_i = \frac{\left\{\dfrac{X_{ij}}{\left(\sum_i X_{ij}\right) - X_{ij}}\right\}}{\left\{\dfrac{\left((\sum_j X_{ij}) - X_{ij}\right)}{\left((\sum_j \sum_i X_{ij}) - (\sum_j X_{ij})\right) - \left((\sum_i X_{ij}) - X_{ij}\right)}\right\}}$$

where X_{ij} are the exports of sector "*i*" of country "*j*"; $\sum_i X_{ij}$ are the total exports of country "*j*"; $\sum_j X_{ij}$ are the world exports of sector "*i*"; and $\sum_j \sum_i X_{ij}$ are total world exports.

An RCA# index greater than 1 indicates that country i has a comparative advantage in the commodity j, and therefore it reveals competitiveness. An RCA# index lower than 1, on the other hand, indicates that country i does not have a comparative advantage in the commodity.

It is important to point out that Balassa and Vollrath indices are based on different concepts and thus are not strictly comparable. According to Edwards and Schoer (2001) and Batha and Jooste (2004), there is generally no significant difference between the empirically calculated RCA and RCA#. Edwards and Schoer (2001) found a high degree of correlation coefficient of more than 0.8 between the RCA and RCA#. For this reason, only Vollrath's (1991) RCA# was used further in the next chapter to calculate the competitiveness of the citrus fruit industry.

4.6.2. Relative Revealed Comparative Trade Advantage (RTA) index

Vollrath (1991) offers an alternative specification of the RCA index that can be used to measure the competitiveness, namely the Relative Revealed Comparative Trade Advantage (RTA) index. The RTA index describes the country's share of the world market pertaining to one commodity relative to its share of all traded goods, and it accounts for imports as well as exports. It obliquely weights revealed competitive advantage by calculating the importance of relative export and relative import competitive advantages. It is calculated as the difference between the relative export advantage (RXA), which equates to the Balassa index[1], and its counterpart, the relative import advantage (RMA).

The model is arithmetically stated as follows:

$$RTA_{ij} = RXA_{ij} - RMP_{ij}$$

where $RXA_{ij} = (X_{ij}/\Sigma_{l,\, l\neq j} X_{il}) / (\Sigma_{k,\, k\neq j} X_{kj} / \Sigma_{k,\, k\neq i} \Sigma_{l,l\neq j} X_{kl})$ while $RMP_{ij} = (M_{ij} / \Sigma_{l,\, l\neq j} M_{il}) / (\Sigma_{k,\, k\neq i} M_{kj} / \Sigma_{k,\, k\neq i} \Sigma_{l,\, l\neq j} M_{kl})$

The *X* and *M* refer to exports and imports respectively, with the subscripts *i* and *k* denoting product categories, while *j* and *l* denote country categories. The numerator in RXA equation

[1] Vollrath's RXA differs from Balassa's RCA in that it eliminates country and commodity double counting, and it accounts for all traded goods and all countries, rather than sub-sets, and is therefore global in nature.

and RMP equation is equal to a country's exports (imports) of a specific product category relative to the exports (imports) of this product from all countries, except for the country in consideration. The denominator reveals the exports (imports) of all products, except for the commodity in consideration from the respective country as a percentage of all other countries' exports (imports) of all other products. The level of these indicators represents the degree of revealed export competitiveness and import penetration. Values above zero point to a competitive trade advantage and values below zero point to a competitive trade disadvantage.

While the calculations of indexes RXA and RMP are exclusively based on either the export or import values, only the RTA considers both export and import activities. Frohberg and Hartmann (1997) argue that the RMP index can be very misleading, since it can be heavily distorted due to the protection of domestic markets. For example, in the extreme case of an import ban or a prohibitively high import tariff, the RMP measure indicates a high level of competitive advantage, and the reverse might be the case. Another factor that can lead to a distortion of all indicators considering exclusively either exports or imports is the existence of the intra-industry trade. For example, in the case where the country acts only as a transit country, the RXA might indicate a high level of competitiveness that would be purely superficial (Pitts *et al.*, 1995). Therefore, given that the RTA index includes both exports and imports, it is a more comprehensive and superior measure. It makes a clear distinction between a specific commodity and all other commodities, and between a specific country and the rest of the world, thus eliminating country and commodity double counting.

The RTA model allows for the measurement of competitiveness under real world conditions, such as uneven economic playing fields, distorted economies and different trade regimes (Esterhuizen & Van Rooyen, 2006; Vollrath, 1991). However, there are several challenges with the use of the RTA index. The index may misrepresent the underlying competitive advantage (Ferto & Hubbard, 2002). It may also say nothing about how the country acquires its market share, which may well be maintained by costly government incentives (Mosoma, 2004).

Given the above, care should be exercised when interpreting RTA indexes because when comparing a cross-section of RTA indicators, different aspects of the formula can change and, with them, the interpretation of the RTA indicators. Table 4.1 gives some indication of how to interpret different cases of the RTA index. In considering case one, a comparison of differences in the RTA indicators for different commodities or products traded for the same country with the same reference countries can make use of the real value of the RTA indicator. The higher the value of the indicator, the greater the competitiveness the product has over other products. In

case two, a specific country's competitiveness for a specific product or commodity is compared against different reference countries. A comparison of the RTA indicator rank enables one to determine the relative importance of the traded commodity to those of different trading partners. In case three, special care needs to be exercised, as different size economies will affect the absolute value of the RTA indicator. However, by using trend analysis, the competitiveness of different countries can be compared.

Table 4.1: A framework for interpreting different cases of the RTA index

Case	Country or group of countries to be analysed	Commodity product or commodity group	Group of reference countries	Interpretation
1	Same	Different	Same	RTA indicators can be compared between products/commodities. The higher the value of the indicator, the greater the competitive advantages the product has over the other products in the country that has been analysed.
2	Same	Same	Different	A specific country's competitiveness for a specific product or commodity is compared to different reference countries. A comparison of the RTA indicator rank enables one to determine the relative importance of the traded commodity with different trading partners.
3	Same	Same	Same	Special caution needs to be exercised in this case. The index is affected by the size of the economy. Trends should preferably be used to compare competitiveness between the countries.

Source: Adapted from Valentine and Krasnik (2000).

4.6.3. Net Export Index (NX_i)

The RCA index has been widely criticised, largely due to the fact that it only takes exports into account, ignoring the level of imports. According to Vollrath (1991), with differentiated products, intra-industry trade, and flows of exports and imports, the net trade effects should be taken into

account. Balassa also proposed an alternative measure of competitiveness called the Net Export index (NX_i), where net exports are exports minus imports. In order to calculate the index, the net exports are divided by the total value of the trade (exports plus imports) of the commodity in question. Another alternative way to calculate the Net Export index is to divide the numerator ($X_i - M_i$) by domestic production (Y_i), instead of total trade (Traill & Gomes da Silva, 1996). The NX_i index formula is expressed arithmetically as:

$$NX_i = [(X_i - M_i)/(X_i + M_i)] \times 100$$

where X_i is exports and M_i is imports. An index with an upper limit of 100 indicates that there are no imports, and a lower limit of negative 100 indicates that there are no exports.

Galetto (cited in Mashabela, 2008) argues that the NX_i has one problem, namely that it does not take into account the overall level of trade in a specific commodity. This implies that a country that is relatively self-sufficient, with a small exportable surplus and no imports, would have an index of 100 and therefore appear to be very competitive, even though it hardly trades at all. For these reasons, Galetto (2003) recommended that both the RCA and NX_i should be used together in assessing and analysing the competitiveness of a specific industry or commodity. Hence this study made use of all three indexes to analyse the competitiveness of South African citrus fruit industry relative to its competitors in the southern hemisphere region.

4.6.4. Porter's competitive diamond model

In addition to the above discussed indexes, the study made use of Porter's competitive diamond methodology to gather key success factors and the constraints impacting on the competitiveness of the domestic citrus fruit industry. Porter (1990) developed the competitive diamond model which allows one to identify and analyse the structure of the industry and point out its strengths and weaknesses. According to Pitts and Lagnevik (1998), this model measures the competitive potential or competitive process, which is often of a qualitative nature. It looks at the availability of superior inputs or factors impacting on the competitiveness of the industry, which could be used to identify and improve the competitiveness.

Figure 4.1 illustrates Porter's (1990) determinants of competitive advantage. Competitiveness lies in six broad criteria or attributes that shape the environment in which firms or industries compete.

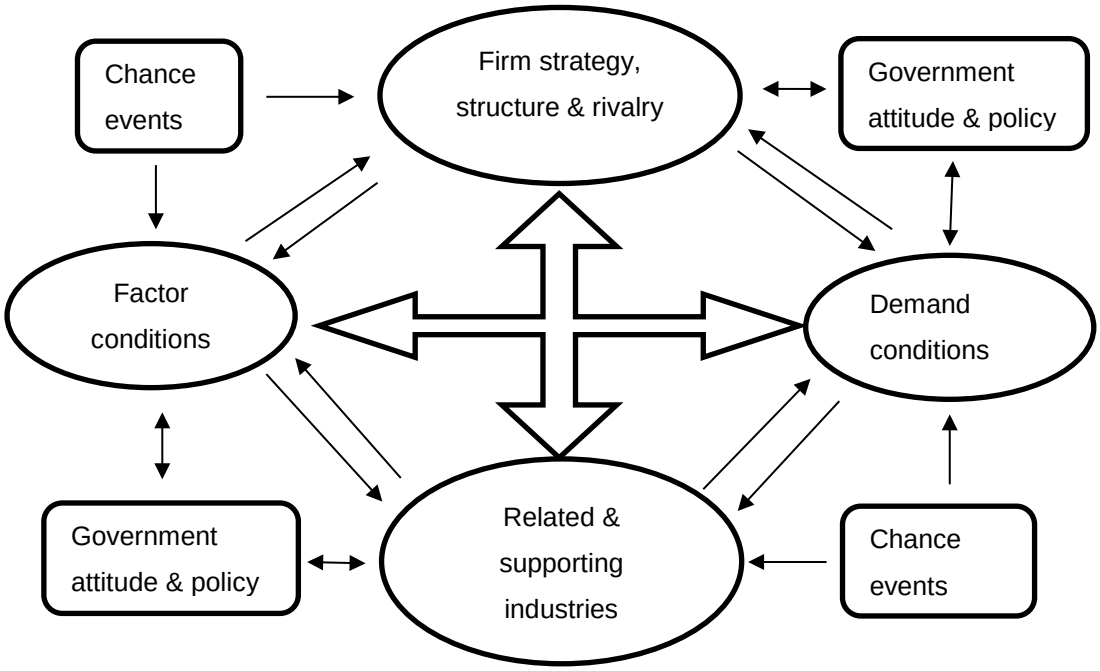

Figure 4.1: Porter's diamond of competitive advantage

Source: Porter (1990).

4.6.4.1. Factor conditions

Factor conditions are advantageous factors of production in certain nations that give the industries a competitive edge over their competitors. These are created factors of production, such as skilled labour (literacy level of workers and quality of labour), infrastructure (e.g. communication system infrastructure and transportation infrastructure), technology (e.g. scientific research and availability of technology) and levels of production costs (e.g. the prices of diesel, labour, machinery and pesticides) necessary to compete in a given industry. The fact that the country has good non-key factors, such as unskilled labour and raw materials, does not generate sustained competitive advantage, as these can be obtained by any industry. However, specialised key factors, such as skilled labour, capital and infrastructure lead to a competitive advantage since these factors are more difficult to duplicate.

4.6.4.2. Demand conditions

Demand conditions are the nature of local demands for the industry products and services and the ability to record these demands. They include home demand composition, demand size and internationalisation of the domestic demand. They are an important factor in helping to produce the competitiveness. For example, a sophisticated domestic market can pressurise a company or an industry to sell superior products. The fact that markets demand high quality products and close proximity enables companies or industries to better understand the needs and wishes of its customers.

4.6.4.3. Relating and supporting industries

This involves the presence or absence in the country of suppliers and related industries that are internationally competitive. Porter (1990) argues that a set of strong, related and supporting industries is important to the competitiveness of firms or industries. When local supporting industries and suppliers are competitive, local companies or industries are potentially likely to be more cost efficient, thus resulting in them becoming competitive as well. The related and supporting industries can include research institutions, financial institutions, transportation companies, electricity suppliers, agricultural inputs and packaging materials.

4.6.4.4. Firm strategy, structure and rivalry

Conditions exist that govern how companies or industries are created, organised and managed, and the nature of the domestic rivalry. These conditions involve culture, structure, managerial skills, pricing strategy, buyers and suppliers' market power, threats of new industry and substitutes. If the competitiveness is very strong in the domestic market, the industry may develop skills that can be used as competitive advantage internationally.

4.6.4.5. Government support and policy

Government plays an important role in the international competitiveness and it can influence each of the above determinants either positively or negatively through its policies (such as trade policy, land reform policy, agriculture policy, labour policy, environment policy, financial and tax policy) and operational capacity (e.g. funding and subsidies). Porter (1990) argues that government, as a determinant of competitiveness, must be viewed apart from the above four determinants.

4.6.4.6. Role of chance

Role of chance are factors that happen beyond the power of an industry and often the national government. They are events that have little to do with circumstances in the nation and are often largely outside the power of firms and often the national government to influence. They can either harm or benefit the industry's competitive position. Such events include wars, political decisions by foreign governments, large increases in demand, shifts in world financial markets and exchange rates, discontinuity of technology or major technological breakthroughs or inventions, crime and diseases like HIV/AIDS.

The advantage of Porter's diamond model is that it evaluates all the participants in the value chain, not only the competitiveness of the producers (Porter, 1990). While the model identifies and analyses the industry's structure and points out its strengths and weaknesses, it also identifies the critical success factors of the industry. This model has been used broadly by

several researchers to measure competitiveness of numerous agricultural sub-sectors in South Africa (Edwards *et al*., 2000; Edwards & Schoer, 2001; Esterhuizen & Van Rooyen, 1999; Valentine & Kransnit, 2000, Van Seventer & Molate, 2002, Mashabela & Vink, 2008, and Ndou & Obi, 2011).

4.7. Summary

This chapter outlined the research design and methodology to be used to analyse the competitiveness of the South African citrus fruit industry relative to its southern hemisphere competitors. Three internationally recognised measures of competitive performance are used in the next chapter to calculate the competitiveness – namely, the RCA# index, the Net Export index (NX_i) and the RTA index. The first two measures – namely, the RCA# and the NX_i – were used as complementary measures, and the RTA index was used independently as an alternative to the other two. These indexes fit into this study because they produced accurate results, even though they have shortfalls. In addition to these indexes, the study also made use of a survey adopted from the Porter's model to collect primary data from relevant stakeholders within the industry.

CHAPTER 5: PRESENTATION AND INTERPRETATION OF RESULTS

5.1. Introduction

The purpose of this chapter is to apply the indexes discussed in the previous chapter – namely, the RCA#, the NX_i index and the RTA index – to determine the revealed competitive status of the South African citrus fruit industry relative to the same industry in Argentina, Australia, Uruguay, Chile and Peru. The first two indexes are used together to assess the revealed competitiveness of each country because, according to Galetto (2003), the NX_i index does not take the overall level of trade in a specific commodity into account.

The first part of the chapter gives a comparison of the revealed comparative advantage based on the RCA# index, the NX_i index and the RTA index. The second part provides the empirical determination of the factors affecting the competitiveness of the South African citrus fruit industry using Porter's methodology.

5.2. Comparative advantage of South Africa's citrus fruits relative to its competitors in the southern hemisphere

In this section the results of applying the RCA#, the NX_i and the RTA index simultaneously to the citrus fruit industry are discussed. It should be noted at this point that any measure of the revealed comparative advantage can be distorted by aggregation and policy effects. The availability of data at different levels of aggregation and data bias caused by the government policy distortions (e.g. non-trade barriers and export subsidies) cause immeasurable damage to the 'true' patterns of comparative advantage. Mashabela and Vink (2008) argue that this is especially true in the agricultural sector, where government interference is commonplace. Therefore, readers should give careful thought to the level of aggregation at which the RCA# indexes are constructed. Furthermore, the RCA# indexes are static in nature and compare a country's share of the world market in one commodity relative to its share of all traded goods. It is, therefore, advisable to interpret the RCA# index results with caution.

5.2.1. Orange and orange juice RCA#, NX_i and RTA indices

Table 5.1 depicts the orange RCA# index of South Africa and its southern hemisphere competitors. As stipulated in section 4.6.1 of the previous chapter, the RCA# index greater than 1 indicates a comparative advantage and the RCA# index lower than 1 indicates a comparative disadvantage. For most of the period depicted in Table 5.1, Peru's oranges have RCA# index values of less than 1, indicating a revealed comparative disadvantage.

Galetto (2003) argues that the RCA# index value higher than 10 for a specific product of a country shows a strong comparative advantage for this product. For the whole period depicted in Table 5.1, Uruguayan oranges had all their RCA# values remaining at more than 40, except in 2012. Its RCA# index values are higher than all its competitors in the southern hemisphere region, an indication that this country has the strongest revealed comparative advantage in this product category. South Africa, on the other hand, has the second highest RCA# values that remain above 20, meaning it also shows a strong revealed comparative advantage for this product category.

Table 5.1: Oranges (fresh or dried) RCA# index (HS code '080510)

Country	RCA# 2004	RCA# 2005	RCA# 2006	RCA# 2007	RCA# 2008	RCA# 2009	RCA# 2010	RCA# 2011	RCA# 2012	Av 2
Uruguay	79.3	80.7	75.1	75.5	42.8	44.3	44.1	40.7	22.7	
SA	24	23.7	26.9	28	26.3	25	32	27.4	30	
Chile	3	2.2	2.9	1.8	2.6	4.4	5.6	6.5	6.8	
Argentina	3.9	4.3	5.3	6	4.1	3	3.1	2.5	1.4	
Australia	3.2	3.5	3.4	3.7	2.2	2.2	1.5	1.5	4.9	
Peru	0.03	0.1	0.1	0.2	1	1.7	0.6	1	1	

Source: Own calculations based on data from International Trade Centre (2014)

The NX_i index values for oranges are given in Table 5.2. As mentioned earlier in section 4.6.3 of Chapter Four, an upper limit of 100 indicates no imports and a lower limit of negative 100 indicates no exports. South Africa, Uruguay and Argentina NX_i index values for oranges indicate a strong net export for the whole period with values mostly above 95. Peru, on the other hand, showed a negative NX_i index value in 2004 before showing a positive value, an indication that this country was a net importer of oranges in 2004.

Table 5.2: Oranges (fresh or dried) NX_i index (HS code '080510)

Country	NX_i 2004	NX_i 2005	NX_i 2006	NX_i 2007	NX_i 2008	NX_i 2009	NX_i 2010	NX_i 2011	NX_i 2012	Average 2004/12
SA	99.9	99.8	99.5	99.7	99.1	99.7	99.9	99.9	99.9	99.7
Uruguay	100	100	99.4	98.7	99.9	98.7	99.5	99.5	99.4	99.4
Argentina	99.4	100	98.8	98.8	96	98.6	98.1	97.7	100	98.6
Chile	98.6	99.1	98.3	97.8	96.2	98.7	91.3	96.9	94.7	96.8
Australia	79.2	79.1	76.4	80.7	72.8	72.3	62.6	58.9	72.1	72.7
Peru	-48.9	36.7	32.8	76.8	97.5	99	97.3	98.5	95.6	65

Source: Own calculations based on data from International Trade Centre (2014)

The RCA# method used above compares a country's share of the world market in one commodity with its share of all traded goods. The NX_i, also used above, does not take the overall level of trade in a specific commodity into account. In this section, the RTA index is used to analyse the competitiveness of oranges for different countries in the southern hemisphere. According to Mashabela and Vink (2008), this specific index is a comprehensive and superior measure of competitiveness, given the fact that it takes both imports and exports into account and it eliminates double counting.

Table 5.3 shows the RTA index values calculated for the last nine years to 2012. According to Scott and Vollrath (1992) as well as Galetto and Cappellini (2003), positive RTA indexes indicate a global competitive advantage and vice versa. From Table 5.3 it is clear that oranges RTA index values for South Africa are higher than all other countries, with values hovering around the 20s for the whole period. This indicates that South Africa's oranges experience a stronger relative competitive advantage compared to other countries. It is followed by Uruguay, which has a negative trend for the whole period depicted in the table. The RTA calculations agree with the analysis of the RCA# index, which identifies South Africa and Uruguay as having stronger and higher revealed competitive advantage in the oranges product category. However, Uruguay (as well as Argentina) recorded a negative RTA index trend throughout the whole period, an indication that it could be losing its competitiveness.

Table 5.3: Oranges (fresh or dried) RTA index (HS code '080510)

Country	RTA 2004	RTA 2005	RTA 2006	RTA 2007	RTA 2008	RTA 2009	RTA 2010	RTA 2011	RTA 2012	Average 2004/12	Trend 2004/12
SA	23.8	23.5	26.7	27.8	26	24.8	31.7	27.3	29.8	26.8	+
Uruguay	30	33.8	30	33.5	22.6	18.1	18.8	17.2	9.9	23.8	-
Argentina	3.9	4.3	5.2	6	4	3	3.1	2.4	1.4	4	-
Australia	2.9	3.2	3	3.4	1.9	1.9	1.2	1.1	6.4	2.8	+
Chile	1.1	0.9	1.2	0.8	1.3	1.8	2.3	2.7	2.9	1.7	+
Peru	-0.02	0.02	0.01	0.1	0.5	0.7	0.3	0.4	0.4	0.3	+

Source: Own calculations based on data from International Trade Centre (2014)

Notes: RTA>0⇒Global competitive advantage; RTA<0⇒Global competitive disadvantage, "+"⇒ positive trend; "-"⇒ negative trend; and "="⇒ constant trend

For oranges to which value has been added (i.e. orange juice), Uruguay has a much better revealed comparative advantage than its competitors in the southern hemisphere region. Tables 5.4 clearly illustrates that this country's orange juice RCA# index values are higher than 2, while the RCA# values of other countries remain at just over 1, with some even less than 1. South Africa, which has a strong revealed comparative advantage in primary oranges, has

RCA# index values of less than 1 in most periods depicted in Table 5.4. This clearly shows that its competitiveness decreases when moving from primary to processed products.

One possible explanation for this could be the high rates of return recorded for farm-level applications of technology for most primary citrus fruit commodities. Value-added activities higher up in the agricultural value chain were somewhat ignored within the agricultural research and development (R&D) expenditures. According to Esterhuizen *et al*. (2001), historically, agricultural R&D focused on farm-level innovation and this led to high rates of return at this level. This phenomenon can, to some extent, explain why there is a decline in competitiveness when moving from the primary to processed products. To reverse this situation, more direct investments in R&D within the value-adding activities is required.

The results and analysis above support the studies conducted by several researchers, such as Esterhuizen and Van Rooyen (1999), Esterhuizen and Van Rooyen (2001), Van Rooyen (1998), Van Rooyen *et al*. (2000), Van Rooyen and Esterhuizen (2001), Krabbe and Vink (2000), Jooste and Van Schalkwyk (2001), Venter and Horsthemke (1999), Mosoma (2004), Hallatt (2005), and Mashabela and Vink (2008), who found that several of the agricultural products they investigated revealed that their competitiveness generally decreased when moving from primary to processed products.

Table 5.4: Orange juice RCA# index (HS code ' 200911)

Country	RCA# 2004	RCA# 2005	RCA# 2006	RCA# 2007	RCA# 2008	RCA# 2009	RCA# 2010	RCA# 2011	RCA# 2012	Av 2
Uruguay	2.4	4.5	6.1	4.4	3.6	2.3	5.4	2.6	3.3	
Argentina	0.7	1.4	1.6	1.1	1.4	1.6	1.6	1.3	1.3	
SA	0.3	0.5	1.7	0.7	0.4	1	1.3	0.6	0.7	
Australia	0.1	0.01	0.03	0.04	0.07	0.04	0.1	0.02	0.05	
Chile	0.01	0.05	0.01	0.01	0.01	0.01	0.02	0.02	0.01	
Peru	0	0	0	0	0	0	0	0	0	

Source: Own calculations based on data from International Trade Centre (2014)

Table 5.5 shows the orange juice NX_i index values over the past nine years to 2012. Australia, Chile and Peru show negative NX_i index values throughout the entire period, an indication that these countries were net importers of orange juice from 2004 to 2012. South Africa's NX_i index values indicate a strong net export for the whole period, with an average value of 84.4.

Table 5.5: Orange juice NX_i index (HS code ' 200911)

Country	NX_i 2004	NX_i 2005	NX_i 2006	NX_i 2007	NX_i 2008	NX_i 2009	NX_i 2010	NX_i 2011	NX_i 2012	Average 2004/12
SA	83.8	89.5	99.2	92.9	58	97.8	97.1	63.7	77.4	84.4
Uruguay	74.2	94.4	98.1	95.1	96.7	65.6	68.9	35.4	44.2	74.7
Argentina	20.5	68.3	72.4	-7.5	26.5	58.9	24.3	53.2	48.5	40.6
Australia	-95.3	-98.9	-97.7	-97.3	-94.1	-97.1	-94.6	-98.1	-95.4	-96.5
Chile	-98.1	-86.4	-97.4	-97.4	-97.9	-97.9	-98	-97.7	-98.6	-96.6
Peru	-100	-100	-100	-100	-100	-100	-100	-100	-100	-100

Source: Own calculations based on data from International Trade Centre (2014)

The RTA index values of the orange juice show that Uruguay exhibits a better revealed competitive advantage and a constant trend. South Africa, on the other hand, experienced a marginal relative revealed competitive advantage also with a constant trend for the whole period depicted in Table 5.6 . The reason for this could be the deregulation of the industry, which increased the vulnerability of the citrus fruit producers to the external commercial risks. Deregulation led to a short-term shortage of essential services formerly provided by the boards, such as storage, value-adding and processing.

As is the case with the RCA# index values, the RTA index values clearly show that the competitiveness of the South African oranges decreases when moving from primary to processed products. Therefore, an important observation made from this analysis is that value-adding opportunities are still limited or constrained in the orange subsector, since the competitiveness of this product category decreases from primary to processed products. This clearly confirms the results already produced by several researchers such as Mosoma (2004), Hallatt (2005), and Mashabela and Vink (2008), who concluded that the competitiveness of the domestic agricultural products decreases downstream.

Table 5.6: Orange juice RTA index (HS code ' 200911)

Country	RTA 2004	RTA 2005	RTA 2006	RTA 2007	RTA 2008	RTA 2009	RTA 2010	RTA 2011	RTA 2012	Average 2004/12	Trend 2004/12
Uruguay	2	4.4	6.1	4.3	3.6	1.9	4.7	1.7	2.4	3.5	=
SA	0.3	0.5	1.7	0.7	0.3	1	1.2	0.5	0.6	0.8	=
Argentina	-0.05	1	1.2	-0.5	0.4	1	0.5	0.9	0.8	0.6	+
Peru	-0.3	-0.3	-0.2	-0.2	-0.3	-0.1	-0.3	-0.1	-0.3	-0.2	-
Chile	-0.9	-0.8	-0.9	-1.2	-1.2	-1.1	-1.6	-1.6	-1.8	-1.2	-
Australia	-3.1	-2.2	-2.3	-2.6	-2.3	-2.4	-2	-2.5	-2	-2.4	+

Source: Own calculations based on data from International Trade Centre (2014)

Notes: RTA>0⇒Global competitive advantage; RTA<0⇒Global competitive disadvantage, "+"⇒ positive trend; "-"⇒ negative trend; and "="⇒ constant trend

5.2.2. Grapefruit and grapefruit juice RCA#, NX_i and RTA indices

South Africa has a higher and stronger revealed comparative advantage for grapefruits in their primary form than its southern hemisphere competitors. Table 5.7 clearly shows that this country's RCA# index values are higher than those of its southern hemisphere competitors throughout the whole period. The RCA# index values are higher than 20, an indication that South Africa has a strong revealed comparative advantage. Uruguay, on the other hand, started with a marginal revealed comparative advantage in the period 2004 until 2007, before recording a revealed comparative disadvantage from 2006 onwards. Argentina only recorded a revealed comparative disadvantage in 2012, with the RCA# index value of 0.3.

Table 5.7: Grapefruit (fresh or dried) RCA# index (HS code '080540)

Country	RCA# 2004	RCA# 2005	RCA# 2006	RCA# 2007	RCA# 2008	RCA# 2009	RCA# 2010	RCA# 2011	RCA# 2012	Av 2
SA	36	42.5	27.1	28.8	24.3	26.2	25.6	30.3	26	
Argentina	5.2	5.6	3.2	3.8	5.7	2.6	1.8	1.3	0.3	
Uruguay	3.1	2.5	3.8	1.6	0.5	0.4	0.2	0.3	0.1	
Chile	1.2	0.3	0.7	0.2	0.2	0.2	0.3	0.2	0.3	
Australia	0.1	0.05	0.1	0.04	0.04	0.1	0.1	0.04	0.1	
Peru	0.002	0.02	0.02	0.01	0.1	0.01	0.1	0.1	0.1	

Source: Own calculations based on data from International Trade Centre (2014)

It is apparent from Table 5.8 that Argentina and South Africa have higher net export index values. These two countries were net exporters of grapefruits for the whole period depicted in the table. Australia, on the other hand, was a net importer for the whole period, except in 2009 when it recorded positive trade balance.

Table 5.8: Grapefruit (fresh or dried) NX_i index (HS code '080540)

Country	NX_i 2004	NX_i 2005	NX_i 2006	NX_i 2007	NX_i 2008	NX_i 2009	NX_i 2010	NX_i 2011	NX_i 2012	Average 2004/12
Argentina	100	100	100	100	100	100	100	100	100	100
SA	99	99.4	98.4	98.8	99.1	99.1	99.3	99.5	99.1	99.1
Chile	98.7	99.2	100	99.4	100	100	82.9	77.2	92.2	94.4
Uruguay	93.1	88.5	93.2	83.4	18.1	33.9	-7.5	9.8	-24.8	43.1
Peru	-97.7	-43.3	-51.7	-2.4	58.8	53.8	89.8	100	100	23
Australia	-15.1	-30.3	-20.1	-33.7	-30.3	0.5	-15.7	-34.6	-5.7	-20.6

Source: Own calculations based on data from International Trade Centre (2014)

As is the case with the RCA# index values, the RTA index values of grapefruits in their primary form depicted in Table 5.9 shows that South Africa has a relatively stronger competitive

advantage than its southern hemisphere competitors. Its RTA index values are higher than those of its competitors, with values averaging 29.5 for the whole period. It is interesting to note that all other countries recorded a negative RTA index trend throughout the entire period, with the exception of Peru, which recorded a positive trend.

Table 5.9: Grapefruit (fresh or dried) RTA index (HS code '080540)

Country	RTA 2004	RTA 2005	RTA 2006	RTA 2007	RTA 2008	RTA 2009	RTA 2010	RTA 2011	RTA 2012	Average 2004/12	Trend 2004/12
SA	35.8	42.4	27	28.7	24.2	26.1	25.5	30.2	25.9	29.5	-
Argentina	5.2	5.6	3.2	3.8	5.7	2.6	1.8	1.3	0.3	3.3	-
Uruguay	3.1	2.4	3.7	1.5	0.3	0.3	0.04	0.1	-0.01	1.3	-
Chile	1.2	0.3	0.7	0.2	0.2	0.2	0.2	0.2	0.3	0.4	-
Peru	-0.1	-0.03	-0.04	-0.01	0.1	0.01	0.1	0.1	0.1	0.02	+
Australia	0.01	-0.02	-0.01	-0.03	-0.02	0.01	-0.02	-0.05	0.003	-0.01	-

Source: Own calculations based on data from International Trade Centre (2014)

Notes: RTA>0⇒Global competitive advantage; RTA<0⇒Global competitive disadvantage, "+"⇒ positive trend; "-"⇒ negative trend; and "="⇒ constant trend

Table 5.10 shows that only South African grapefruit juice displayed a strong revealed comparative advantage. Its RCA# index values are mostly above 20, while those of others countries are generally less than 10. Argentina has marginal comparative advantage, with its RCA# index values averaging 7.5 for the whole period.

Table 5.10: Grapefruit juice RCA# index (HS code ' '200929)

Country	RCA# 2004	RCA# 2005	RCA# 2006	RCA# 2007	RCA# 2008	RCA# 2009	RCA# 2010	RCA# 2011	RCA# 2012	A 2
SA	19.9	45.4	69.5	39.5	29.2	31.4	32.5	34.1	25.7	
Argentina	6.2	19.3	14.7	6.9	5	4.6	4.9	3.2	2.4	
Uruguay	5.2	5.9	6.8	2.8	0.4	1.9	1.1	0.5	0	
Australia	0.5	1.2	0.7	0.2	0.1	0	0	0.1	0.2	
Chile	0	0.01	0	0.02	0.02	0.05	0.04	0.03	0	
Peru	0	0	0	0	0	0	0	0	0	

Source: Own calculations based on data from International Trade Centre (2014)

The NX_i index values for grapefruit juice are given in Table 5.11. South Africa shows a strong positive net export index values throughout the period, an indication that this country was a net exporter of grapefruit juice from 2004 to 2012. Chile, on the other hand, shows negative net export index values throughout the period, while other countries such as Argentina, Australia and Uruguay showed some negative values in certain periods.

Table 5.11: Grapefruit juice NX_i index (HS code ' '200929)

Country	NX_i 2004	NX_i 2005	NX_i 2006	NX_i 2007	NX_i 2008	NX_i 2009	NX_i 2010	NX_i 2011	NX_i 2012	Average 2004/12
SA	99.70	99.30	99.50	99.80	98.40	99.10	99.90	99.30	100.00	99.40
Argentina	98.30	100.00	99.90	95.40	99.40	97.60	99.90	74.30	-2.60	84.70
Uruguay	98.00	79.80	97.60	97.00	70.40	100.00	-3.00	92.00	-100.00	59.10
Australia	0.40	9.80	-8.90	-63.10	-38.80	-75.00	-87.40	-30.90	-20.50	-34.90
Chile	-100.00	-68.40	-100.00	-66.70	-68.00	-60.50	-71.00	-51.30	-100.00	-76.20
Peru	-100.00	-100.00	*	-100.00	-100.00	-100.00	-100.00	-100.00	-100.00	*

Source: Own calculations based on data from International Trade Centre (2014)

Note: *⇒ data not available

As is the case with the RCA# index values, the grapefruit juice RTA index values show that South Africa has a stronger competitive advantage than its southern hemisphere competitors. Its RTA index values are higher than those of its southern hemisphere competitors, with values averaging 36.3 for the whole period. Argentina is experiencing a marginal competitive advantage for most periods depicted in Table 5.12, and exhibits negative trend. All the countries recorded negative trends throughout the whole period.

The results and analysis above contradict some of the studies already conducted by several researchers such as Esterhuizen and Van Rooyen (1999), Esterhuizen and Van Rooyen (2001), Van Rooyen (1998), Van Rooyen *et al*. (2000), Van Rooyen and Esterhuizen (2001), Krabbe and Vink (2000), Jooste and Van Schalkwyk (2001), Venter and Horsthemke (1999), Mosoma (2004), Hallatt (2005), and Mashabela and Vink (2008), who found that the competitiveness of the South African agricultural products generally decreases when moving from primary to processed products. In this case, the grapefruit juice revealed the strongest competitive advantage, with an average RTA value of 36.3 than the primary grapefruit with an average RTA index value 29.5.

Table 5.12: Grapefruit juice RTA index (HS code ' '200929)

Country	RTA 2004	RTA 2005	RTA 2006	RTA 2007	RTA 2008	RTA 2009	RTA 2010	RTA 2011	RTA 2012	Average 2004/12	Trend 2004/12
SA	19.9	45.3	69.4	39.4	29	31.3	32.5	34	25.7	36.3	-
Argentina	6.2	19.3	14.7	6.8	5	4.5	4.9	2.8	-0.2	7.1	-
Uruguay	5.2	5.6	6.7	2.8	0.3	1.9	0.4	0.5	-1.6	2.4	-
Australia	0.3	0.7	0.2	-0.3	-0.1	-0.2	-0.1	-0.1	-0.1	0.04	-
Peru	-0.01	-0.01	0	-0.01	-0.03	-0.03	-0.1	-0.1	-0.03	-0.03	-
Chile	-0.02	-0.02	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	-0.09	-

Source: Own calculations based on data from International Trade Centre (2014)

Notes: RTA>0⇒Global competitive advantage; RTA<0⇒Global competitive disadvantage, "+"⇒ positive trend; "-"⇒ negative trend; and "="⇒ constant trend

5.2.3. Lemons and limes RCA#, RTA and NXi indices

Table 5.13 depicts the lemons and limes RCA# index values of South Africa and its southern hemisphere competitors. For the whole period depicted, both Australia's and Peru's lemons and limes have the RCA# index values of less than 1, indicating a revealed comparative disadvantage. Argentina's lemons and limes RCA# index values remained at more than 20, averaging 30.3, and are higher than all other countries. This indicates that Argentina has the strongest revealed comparative advantage of all countries in this product category. South Africa's lemons and limes RCA# index values, on the other hand, averaged 10.7 and are the third highest after Argentina and Uruguay, an indication that it also has the strongest revealed comparative advantage.

Table 5.13: Lemons and Limes (fresh or dried) RCA# index (HS code '080550)

Country	RCA# 2004	RCA# 2005	RCA# 2006	RCA# 2007	RCA# 2008	RCA# 2009	RCA# 2010	RCA# 2011	RCA# 2012	Av 2
Argentina	34.3	37.2	28.6	30.4	50.7	22.1	25.3	19.7	24.1	
Uruguay	15.1	15	13.2	11.6	15.7	10.6	14.7	10.7	10.1	
SA	11.9	10.9	10.1	7.8	8.1	10.2	12.3	13.5	11.8	
Chile	5.9	4.8	4.7	5.9	4.8	4.7	5.1	5.6	4.4	
Peru	0.1	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.5	
Australia	0.1	0.05	0.01	0.06	0.04	0.06	0.03	0.02	0.03	

Source: Own calculations based on data from International Trade Centre (2014)

The NX_i index for lemons and limes is given in Table 5.14. The index values for Peru, South Africa and Argentina NX_i indicate a stronger net export for the whole period, with values above 95. Australia, on the other hand, shows negative net export index values throughout the entire period, an indication that this country is a net importer of lemon and lime products.

Table 5.14: Lemons and Limes (fresh or dried) NX_i index (HS code '080550)

Country	NX_i 2004	NX_i 2005	NX_i 2006	NX_i 2007	NX_i 2008	NX_i 2009	NX_i 2010	NX_i 2011	NX_i 2012	Average 2004/12
Peru	100	100	100	100	100	100	100	100	100	100
SA	100	100	99.9	100	99.8	99.7	99.9	99.9	99.8	99.9
Argentina	99.9	100	99.9	99.9	99.9	96.4	95.5	98.2	99.7	98.9
Uruguay	99.4	97.3	98.1	97.9	97.7	94.9	96.6	89.3	91	95.8
Chile	98.8	98	98	98.2	95	94.3	85.7	72	78.5	91
Australia	-62.6	-80.9	-92.6	-80.5	-72.5	-67.8	-85.6	-81.9	-80	-78.3

Source: Own calculations based on data from International Trade Centre (2014)

From Table 5.15 it is clear that the RTA index values for Argentina are higher than all other countries, with an average RTA index value of 30. This indicates that Argentina's lemons and limes experience a stronger and higher relative revealed competitive advantage compared to the other countries. The RTA index calculations agree with the analysis, based upon the combination of the RCA# and NX_i indexes, which identify Argentina as having stronger and higher revealed competitive advantage in the lemons and limes product category. Uruguay's and South Africa's lemons and limes also reveal strong competitive advantage, both with a negative trend. Only one country, Peru, recorded a positive trend for the period 2004 to 2012.

Table 5.15: Lemons and Limes (fresh or dried) RTA index (HS code '080550)

Country	RTA 2004	RTA 2005	RTA 2006	RTA 2007	RTA 2008	RTA 2009	RTA 2010	RTA 2011	RTA 2012	Average 2004/12	Trend 2004/12
Argentina	34.1	37.1	28.6	30.3	50.4	21.6	24.6	19.5	24.1	30	-
Uruguay	15.1	14.8	13.1	11.5	15.6	10.4	14.5	10.2	9.8	12.8	-
SA	11.9	10.9	10.1	7.8	8	10.2	12.2	13.5	11.7	10.7	-
Chile	5.9	4.7	4.7	5.9	4.7	4.6	4.6	4.6	4	4.9	-
Peru	0.1	0.2	0.2	0.2	0.2	0.3	0.5	0.5	0.5	0.3	+
Australia	-0.2	-0.3	-0.3	-0.4	-0.2	-0.2	-0.4	-0.2	-0.2	-0.3	-

Source: Own calculations based on data from International Trade Centre (2014)

Notes: RTA>0⇒Global competitive advantage; RTA<0⇒Global competitive disadvantage, "+"⇒ positive trend; "-"⇒ negative trend; and "="⇒ constant trend

5.2.4. Mandarins, tangerines and clementines RCA#, NX_i and RTA indices

From Table 5.16 it is clear that Uruguay's mandarins, tangerines and clementines exhibited a higher positive average RCA# index value of 25 over the past nine years to 2012. This is an indication that this country has a stronger revealed comparative advantage in this product category. Other countries had their RCA# values remaining below 10, showing a marginal revealed comparative advantage. South Africa revealed the third highest average RCA# index value of 5, after Uruguay and Peru. This average number indicates that South Africa

experiences marginal revealed comparative advantage in the mandarins, tangerines and clementines product category. Only Australia experienced a revealed comparative disadvantage throughout the entire period, except in 2004, 2005 and 2012 when it recorded a marginal comparative advantage.

Table 5.16: Mandarins, tangerines and clementines RCA# index (HS code '080520)

Country	RCA# 2004	RCA# 2005	RCA# 2006	RCA# 2007	RCA# 2008	RCA# 2009	RCA# 2010	RCA# 2011	RCA# 2012	Av 20
Uruguay	33.4	32.3	32.3	31.9	24.5	20.3	20.4	15.8	13.8	
Peru	3.8	4.3	5.2	4.4	5.1	4.7	5.8	6.3	6.1	
SA	4.9	4.9	5.7	4.4	4.6	4.7	5.1	4.8	5.7	
Argentina	4	3.8	4.9	5.2	5.1	5.5	5.4	5	4.4	
Chile	1.6	1.9	2	1.8	2.2	2.6	2.8	3.4	4.1	
Australia	1.6	1	0.8	0.9	0.7	0.8	0.7	0.8	1	

Source: Own calculations based on data from International Trade Centre (2014)

Table 5.17 indicates the net export index of mandarins, tangerines and clementines over the past nine years to 2012. It is apparent that all countries were net exporters for the whole period. Peru recorded the highest average net export index value, followed closely by Argentina, Uruguay and Chile. South Africa's average net export index of 98.1 puts it as the second last in the list depicted in Table 5.17, just ahead of Australia.

Table 5.17: Mandarins, tangerines and clementines NX_i index (HS code '080520)

Country	NX_i 2004	NX_i 2005	NX_i 2006	NX_i 2007	NX_i 2008	NX_i 2009	NX_i 2010	NX_i 2011	NX_i 2012	Average 2004 - 2012
Peru	100	100	100	100	100	100	100	100	99.9	100
Argentina	99.8	100	100	99.9	100	99.8	99.9	99.9	100	99.9
Uruguay	100	100	99.8	99.9	99.8	99.6	99.6	99.2	100	99.8
Chile	98.8	99.8	100	100	100	99.8	98.9	98.8	99.6	99.5
SA	98.8	98	98.1	97.7	97.9	97.9	98	98	98.3	98.1
Australia	91.7	97.2	77.6	87.6	84.9	84.8	81.6	76.8	82.1	84.9

Source: Own calculations based on data from International Trade Centre (2014)

Uruguay recorded the highest positive RTA index values throughout the whole period depicted in Table 5.18, an indication that this country has a stronger competitive advantage in the mandarins, tangerines and clementines product category than its southern hemisphere competitors. However, it has demonstrated negative trends over the past nine years to 2012. Other countries also recorded moderate RTA index values, indicating marginal relative competitive advantage. As is the case with the RCA# index analysis, South Africa revealed the third highest average RTA index value of 4.9 with positive trend, after Uruguay and Peru, which

also recorded a positive trend. This indicates that South Africa has a marginal competitive advantage in the mandarins, tangerines and clementines product category.

Table 5.18: Mandarins, tangerines and clementines RTA index (HS code '080520)

Country	RTA 2004	RTA 2005	RTA 2006	RTA 2007	RTA 2008	RTA 2009	RTA 2010	RTA 2011	RTA 2012	Average 2004/12	Trend 2004/12
Uruguay	33.2	32.1	32.1	31.7	24.4	20.1	20.3	15.7	13.7	24.8	-
Peru	3.8	4.3	5.2	4.4	5.1	4.7	5.8	6.3	6.1	5.1	+
SA	4.9	4.8	5.6	4.4	4.5	4.6	5.1	4.7	5.7	4.9	+
Argentina	4	3.8	4.9	5.2	5.1	5.5	5.4	5	4.4	4.8	=
Chile	1.6	1.9	2	1.8	2.2	2.6	2.7	3.3	4.1	2.5	+
Australia	1.5	1	0.8	0.8	0.6	0.7	0.6	0.6	0.9	0.8	-

Source: Own calculations based on data from International Trade Centre (2014)

Notes: RTA>0⇒Global competitive advantage; RTA<0⇒Global competitive disadvantage, "+"⇒ positive trend; "-"⇒ negative trend; and "="⇒ constant trend

5.3. Empirical determination of factors affecting the competitiveness of the industry in South Africa: an application of the Porter methodology

Empirical determination of factors affecting the competitiveness of the citrus fruit industry is analysed in this section by making use of the Porter methodology, which is discussed in section 4.6.4 of Chapter Four. Determinants of the competitiveness as described by Porter (1990, 1998) were used to analyse the key success factors that establish the competitive advantage and constraints that impact negatively on the competitiveness with regard to the South African citrus industry.

Information for this section was gathered from the industry by means of a questionnaire (refer to Appendix 2). Because the population size was unknown, it was decided that the non-probability method should be used to determine the sample size. The questionnaires were mostly distributed by fax and/or e-mail. It is important to note that a total of 80 (sample size) questionnaires were sent to different organisations, including producers, processors, industry experts and exporters. Only 32 questionnaires were returned, representing an acceptable response rate of 40 percent. This sample size was representative enough to draw somehow precise findings and conclusions on the study.

A 7-point Likert scale was used to indicate the degree to which each of the determinant factors affected competitiveness or performance of the industry. Scores ranging between 0 and 7 against each determinant factor were awarded based on simple arithmetic means calculated from the responses of the respondents sampled, with a higher score indicating a more

enhancing factor and similarly a lower score denoting a more constraining factor for the competitiveness of the industry. Appendix 1 provides the percentage ratings of the perceptions on some determinant factors affecting competitiveness or performance of the industry.

5.3.1. Factor conditions

Factor conditions refer to the quality of factors of production, natural resources, level of production, cost of labour, diesel, pesticides, machinery and infrastructure necessary to compete in a given industry.

5.3.1.1. Labour conditions

Labour conditions refer to the labour-related variables, such as the availability of skilled labour, quality of skilled labour, cost of skilled labour, availability of unskilled labour, quality of unskilled labour and the cost of unskilled labour. The general perception expressed by respondents on labour conditions and the average ratings of respondents' perception on the above-mentioned labour conditions are presented in Table 5.19a and 5.19b.

The results of the survey suggest that the availability of skilled labour is a key challenge facing the citrus fruit industry, while unskilled labour is available in abundance. It is not surprising that there is abundance of unskilled labour because South Africa is characterised by high levels of unemployment. At the same time, unskilled economic refugees are pouring in from neighbouring countries looking for a better life in South Africa. The majority of the respondents concurred that it is easy to obtain unskilled labour in the industry, with around 43.8% of the respondents agreeing wholeheartedly that it is easy to obtain unskilled labour in South Africa (see also Table 1 of Appendix 1). This perception was confirmed by an average rating of 6.2, which strongly indicates that unskilled labour is easy to obtain in the industry.

Although the industry has a shortage of skilled labour, a large number of respondents believe that the quality of skilled labour is of a high standard and amongst the best in the world. About 21.9 percent of the respondents agreed wholeheartedly that the quality of skilled labour in the industry is amongst the best in the world, while 9.4 percent were indifferent as to whether the quality of skilled labour is amongst the best in the world or held that it is not of a very high quality. The average rating on this variable was 4.4, an indication that the quality of skilled labour in the industry positively impacts the competitiveness of the industry.

Table 5.19a: Percentage ratings of the perceptions on labour conditions

Labour conditions	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Availability of skilled labour in the industry	40.6%	34.4%	9.4%	3.1%	0.0%	9.4%	3.1%
Quality of skilled labour in the industry	12.5%	21.9%	12.5%	9.4%	6.3%	15.6%	21.9%
Cost of skilled labour in the industry	28.1%	25.0%	12.5%	3.1%	6.3%	9.4%	15.6%
Availability of unskilled labour in the industry	0.0%	6.3%	6.3%	0.0%	18.8%	25.0%	43.8%
Quality of unskilled labour in the industry	34.4%	28.1%	15.6%	3.1%	9.4%	6.3%	3.1%
Cost of unskilled labour in the industry	34.4%	31.3%	21.9%	0.0%	0.0%	3.1%	9.4%

Source: Own calculations based on the survey

The cost of unskilled labour in the industry was viewed to be a constraint to the industry's competitiveness with an average score of 2.6. In theory, high supply of unskilled labour would make this affordable. However, the majority of the respondents (34.4%) agreed wholeheartedly that unskilled labour in the industry is too costly. This is probably due to the labour laws such as minimum wages that have been set for all sectors of the economy, including the agricultural sector and its downstream industries, such as the agro-processing sector.

Table 5.19b: Labour conditions ratings

Labour conditions	Average rating according to the Porter determinants
Availability of skilled labour in the industry	2.4
Quality of skilled labour in the industry	4.4
Cost of skilled labour in the industry	3.5
Availability of unskilled labour in the industry	6.2
Quality of unskilled labour in the industry	2.7
Cost of unskilled labour in the industry	2.6

Source: Own calculations based on the survey

5.3.1.2. Cost of doing business

Cost of doing business is an important dimension of the factor conditions shaping the competitiveness of the industry. Countries with low costs of doing business are considered to be business friendly and are likely to attract investors and house industries that have a better chance of being and becoming profitable and competitive. As indicated in Table 5.20a, under

this factor condition the respondents' perception was assessed on three variables – namely, the cost of doing business in the country, the level of development of general infrastructure and the cost of using infrastructure.

Table 5.20a: Percentage ratings of the perceptions on cost of doing business and state of infrastructure

Cost of doing business and state of infrastructure	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Cost of doing business in the industry	25.0%	25.0%	34.4%	0.0%	3.1%	9.4%	3.1%
Level of development of general infrastructure in the industry	6.3%	3.1%	9.4%	6.3%	21.9%	34.4%	18.8%
Cost of using infrastructure in the industry	21.9%	25.0%	34.4%	0.0%	9.4%	6.3%	3.1%

Source: Own calculations based on the survey

South Africa has one of the easiest business environments in the world. This is highlighted by its high ranking in the 2014 World Bank's Ease of Doing Business report. According to this report, South Africa ranked 41st out of 189 countries for its business environment with respect to the general ease of doing business. Despite this, with an average rating of 2.9 the cost of doing business in the industry was viewed by many respondents to be extremely high and a constraint to the industry's competitive success (Table 5.20b). About 25 percent of the respondents agreed wholeheartedly that the cost of doing business in the industry is extremely high, while another 25 percent largely agreed and 34.4 percent agreed somewhat that the cost of doing business is extremely high (see also Table 2 of Appendix 1). This indicates that a large part of industry stakeholders are gravely concerned about this phenomenon and its impact on the competitiveness of the industry.

The industry requires an acceptable standard of infrastructure, such as roads, telecommunications, water supply and port facilities for efficient and proper functioning of their businesses. Over three quarters of the respondents considered the state of general infrastructure in the industry to be well developed, efficient and amongst the best in the world. This determinant factor recorded an average rating of 5.5, an indication that it positively affects the competitive success of the industry. However, most respondents expressed concerns regarding the cost of using the infrastructure. A total 21.9 percent of the respondents agreed wholeheartedly that the cost of infrastructure is extremely high in the industry. With an average rating of 3, the respondents rated the cost of using infrastructure as a constraint to the

industry's competitive success. The challenge facing the industry is, therefore, not the state of general infrastructure but rather the cost of using it.

Table 5.20b: Cost of doing business and state of infrastructure ratings

Cost of doing business and state of infrastructure	Average rating according to the Porter determinants
Cost of doing business in the industry	2.9
Level of development of general infrastructure in the industry	5.5
Cost of using infrastructure in the industry	3.0

Source: Own calculations based on the survey

5.3.1.3. Technology

Van Rooyen *et al*. (2001) argue that technology is viewed as one of the major factors determining the competitive position of any industry. Kirsten (1999) concurs that technology is an important factor in enhancing the competitiveness. He identifies the development of technology that reduces production costs, improves product quality and innovates products as one of the important factors influencing the competitiveness.

Tables 5.21a and 5.21b provide the perception of the respondents and average rating of two variables – namely, the quality of technology and the cost of quality technology – for the citrus fruit industry. These variables' average ratings were 5.8 and 3.1 respectively.

Table 5.21a: Percentage ratings of the perceptions on technology in the industry

Technology in the industry	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Quality of technology for the industry	0.0%	6.3%	9.4%	6.3%	15.6%	37.5%	25.0%
The cost of quality technology for the industry	21.9%	25.0%	31.3%	0.0%	12.5%	6.3%	3.1%

Source: Own calculations based on the survey

The average rate of quality of technology indicates that this factor condition is an enhancement to the industry's competitive success. A quarter of the respondents agreed wholeheartedly that the quality of technology is amongst the best in the world, whilst 37.5 percent largely agreed and 15.6 percent agreed somewhat that the quality of technology is amongst the best in the

world (see also Table 3 of Appendix 1). However, the high cost of acquiring technology is a cause for concern though, as indicated by an average rating of 3.1.

Table 5.21b: Technology in the industry

Technology in the industry	Average rating according to the Porter determinants
Quality of technology for the industry	5.8
The cost of quality technology for the industry	3.1

Source: Own calculations based on survey

5.3.1.4. Natural resources

The availability and accessibility of natural resources such as water, soils and rainfall play a critical role in the competitiveness of agricultural industries. Water is one of the key production inputs, and climatic conditions are key factors of production. Issues that deal with the availability of water and climatic conditions have a direct impact on the citrus fruit production.

South Africa is considered to be a water-scarce country and if the current rate of water usage continues, demand is likely to exceed supply at some point in the near future. Respondents' perception on the availability of water was generally very positive. A total of 18.8 percent of the respondents agreed wholeheartedly that the availability of water for the industry is favourable, whilst just under one third largely agreed and a quarter agreed somewhat that the availability of water for the industry is favourable (Table 5.22a). An average rating of 5.3 (Table 5.22b) is a good indication that the availability of water enhances the competitive success of the industry, as viewed by respondents. However, the new challenge facing the domestic agricultural sector as a whole is water quality, which is fast deteriorating and placing the competitiveness of the sector at risk.

Table 5.22a: Percentage ratings of the perceptions on state of natural resources

State of natural resources	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Availability of water	6.3%	12.5%	6.3%	0.0%	25.0%	31.3%	18.8%
Climatic conditions	28.1%	25.0%	28.1%	0.0%	9.4%	6.3%	3.1%
Quality of soils	28.1%	25.0%	28.1%	0.0%	9.4%	6.3%	3.1%
Rainfall patterns	25.0%	25.0%	21.9%	6.3%	12.5%	6.3%	3.1%

Source: Own calculations based on the survey

Climatic conditions are also factors that determine the production of the citrus fruits. Whilst the majority of the respondents perceived water to be readily available, these respondents were concerned about the climatic conditions (weather patterns), with a total of 28.1 percent agreeing wholeheartedly that the climatic/weather conditions are adverse and are considered to be a constraint to the industry's competitive success. Climatic (weather) and rainfall patterns received an average rating of 2.9 and 3.1 respectively, indicating that they are viewed to be constraint to the industry's competitive success.

Table 5.22b: State of natural resources

State of natural resources	Average rating according to the Porter determinants
Availability of water	5.3
Climatic conditions	2.9
Quality of soils	6.0
Rainfall patterns	3.1

Source: Own calculations based on survey

5.3.2. Demand conditions

Demand conditions refer to the nature of demand for the industry's products and services and the ability to capture this demand through marketing and sales. They are a significant factor in helping generate the competitive success. The size, growth and composition of the domestic market play an important role in making the industry competitive.

Like all industries, the citrus fruit industry produces goods and services in response to buyers and market demands. Tables 5.23a and 5.23b below provide the perception of the respondents and average rating of five demand conditions variables. The local market average rating of 3.2 indicates that this demand condition is detraction to the industry's competitive success. It is not surprising that most of the respondents indicated that the growth of the local market is slow for the investment in new technology that is necessary for the competitive success of the industry.

Table 5.23a: Percentage ratings of the perceptions on the demand conditions

Demand conditions	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Local market size in terms of obtaining economies of scale	15.6%	28.1%	34.4%	0.0%	9.4%	6.3%	6.3%
Local buyers adoption of new products, technologies and processes	6.3%	12.5%	9.4%	6.3%	28.1%	15.6%	21.9%
Growth of the local market in terms of investment in new technology	25.0%	25.0%	34.4%	0.0%	6.3%	6.3%	3.1%
Internationalisation of local buyers	12.5%	18.8%	12.5%	0.0%	21.9%	15.6%	18.8%
Local customers demand for environmentally friendly products	6.3%	15.6%	15.6%	3.1%	15.6%	25.0%	18.8%

Source: Own calculations based on the survey

A total of 15.6 percent of the respondents agreed wholeheartedly that the local market size in terms of obtaining the economies of scale is too small, whilst over a quarter largely agreed and just over one third agreed somewhat that the local market size in term of obtaining the economies of scale is too small (see also Table 5 of Appendix 1).

Table 5.23b: The demand conditions

Demand conditions	Average rating according to the Porter determinants
Local market size in terms of obtaining economies of scale	3.2
Local buyers adoption of new products, technologies and processes	5.0
Growth of the local market in terms of investment in new technology	2.9
Internationalisation of local buyers	4.5
Local customers demand for environmentally friendly products	4.9

Source: Own calculations based on survey

5.3.3. Related and supporting industries

Related and supporting industries refer to the presence or absence of supplier industries and related industries that are internationally competitive. These include input industries, financial institutions, research institutions and suppliers of services such as electricity, telecommunication and internet services. The presence of these industries can mean that products and services that they supply to the citrus fruit industry can be made available at a competitive price and the absence of them can mean that the products and services they supply to the industry can be made available at higher prices because they have to be imported from somewhere else.

Tables 5.24a and 5.24b illustrate the perception of the respondents and average ratings of the related and supporting industries variables. Like any other industry in the economy, the citrus fruit industry is largely dependent on ESKOM for electricity supply. The recent increases in the prices of electricity by ESKOM had a negative impact on the industry's competitiveness. It is not surprising to see the average rating of this variable was 3, an indication that the electricity suppliers are a constraint to the industry's competitive success. A total of 21.9 percent of the respondents agreed wholeheartedly that the electricity suppliers constrain the industry's competitive success, whilst 28.1 percent largely agreed and 31.3 percent agreed somewhat that the electricity suppliers constrain the industry's competitiveness (see also Table 6 of Appendix 1).

Table 5.24a: Percentage ratings of the perceptions on related and supporting industries

Related and supporting industries	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Financial services in South Africa	34.4%	25.0%	18.8%	0.0%	9.4%	6.3%	6.3%
Obtaining credit for your company	28.1%	31.3%	21.9%	0.0%	9.4%	6.3%	3.1%
Scientific research institutions	0.0%	3.1%	3.1%	0.0%	28.1%	31.3%	34.4%
Industry's collaboration with scientific research institutions in their R&D activity	3.1%	6.3%	6.3%	0.0%	21.9%	34.4%	28.1%
Electricity supply impact on competitiveness	21.9%	28.1%	31.3%	0.0%	6.3%	9.4%	3.1%
Telecommunication firm's impact on competitiveness	25.0%	21.9%	21.9%	0.0%	15.6%	12.5%	3.1%
Availability of local suppliers of primary inputs	0.0%	3.1%	6.3%	0.0%	31.3%	37.5%	21.9%
The quality of local suppliers of your industry primary inputs	0.0%	6.3%	0.0%	0.0%	28.1%	34.4%	31.3%
The sustainability of local suppliers of your industry primary inputs	0.0%	6.3%	6.3%	0.0%	25.0%	28.1%	34.4%
Availability of storage facilities	15.6%	18.8%	21.9%	3.1%	9.4%	15.6%	15.6%
The cost of using storage facilities	15.6%	25.0%	21.9%	0.0%	6.3%	15.6%	15.6%
Availability of transport	12.5%	28.1%	25.0%	3.1%	6.3%	9.4%	15.6%

Source: Own calculations based on the survey

Another important related industry is telecommunications. Telecommunication costs are apparently very high in South Africa. Therefore, it does not come as a surprise to see the majority of respondents (a total of 25 percent) agreeing wholeheartedly that the telecommunication firms are constraint to the industry's competitive success. This determinant

factor recorded an average rating 3.3, implying this as a constraint to the industry's competitiveness.

The citrus fruit farming requires capital investment and is therefore dependent on access to credit for, amongst other things, equipment and machinery. Access to finance is one of the cornerstones for the existence of any business that requires capital investment. Despite the availability of a sophisticated banking system in South Africa, praised as being of international standards, financial institutions' average rating of 2.9 generally shows that this variable is a constraint to the industry's competitive success. Hence, it is expected to see most respondents viewing access to credit extremely difficult. These results support Ndou's (2012) argument that the business environmental challenges that uniquely influence the performance of the small and emerging citrus fruit farmers include the accessibility to support programmes from the government and other role players, credit policies of various financial institutions and the use of title deeds as a form of collateral.

Fresh citrus fruits are highly perishable and therefore require a fast mode of transport for the movement of fruits from the farm to the market, more especially for the export market. Considering high costs of road transport, it is interesting to discover that the availability of transport received a rating of 3.8, with a total 12.5 percent of the respondents agreeing wholeheartedly that transport is not readily available to transport the citrus fruits. Transport charges are still considered as too high in the entire agricultural sector.

The influence of research institutions in the industry is significant. The two organisations – namely, the CGA and Citrus Research International (CRI) – are more of an axis around which the competitiveness and the performance of the industry revolve. This may be due to the fact that they are a citrus farmer representative organisation.

Table 5.24b: Related and supporting industries

Related and supporting industries	Average rating according to the Porter determinants
Financial services in South Africa	2.9
Obtaining credit for your company	2.8
Scientific research institutions	6.2
Industry's collaboration with scientific research institutions in their R&D activity	5.8
Electricity supply impact on competitiveness	3.0
Telecommunication firms' impact on competitiveness	3.3
Availability of local suppliers of primary inputs	6.0
The quality of local suppliers of your industry primary input	6.2
The sustainability of local suppliers of your industry primary inputs	6.0
Availability of storage facilities	4.1
The cost of using storage facilities	3.9
Availability of transport	3.8

Sources: Own calculations based on survey

5.3.4. Firm strategy, structure and rivalry

Firm strategy, structure and rivalry are conditions within the country governing how companies are created, organised and managed, and the nature of the domestic rivalry. Tables 5.25a and 5.25b illustrate the perception of the respondents and the average ratings of the impact of firm strategy, structure and competitive rivalry, as determinants of the competitiveness of the South African citrus fruit industry.

Table 5.25a: Percentage ratings of the perceptions on the competitiveness impact of firm strategy, structure and rivalry

Firm strategy, structure and rivalry on competitiveness	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Industry's expenditure on R&D	0.0%	6.3%	3.1%	0.0%	28.1%	28.1%	34.4%
The information flow from primary suppliers to your company	0.0%	6.3%	6.3%	0.0%	25.0%	34.4%	28.1%
The flow of information from customers to your company	3.1%	0.0%	6.3%	0.0%	28.1%	31.3%	31.3%
Competition in the local market	3.1%	9.4%	6.3%	0.0%	31.3%	21.9%	28.1%
Entry of new competitors	9.4%	34.4%	37.5%	0.0%	9.4%	6.3%	3.1%
Competition in international market	9.4%	9.4%	12.5%	0.0%	21.9%	25.0%	21.9%

Source: Own calculations based on the survey

The industry's competitive success can be influenced by how well and fast information flows from the end user to the manufacturer or the producer and how well producers respond to it. Well-informed product development processes are based on, amongst other critical factors, the flow of information from the end user back to the producer. Understanding and responding to the end user's needs and expectations is of vital importance in sustaining the existence of the producers. The assessment of the industry's perception on the flow of information from the consumers to the producers and the processors is of great importance in competitiveness analysis. An average rating of 6.1 on the flow of information from the customers to the companies indicates a very fortunate situation for the industry, as it is considered to be very good. This is the same case with the flow of information from the primary suppliers to the producers.

The citrus fruit industry is export-driven, with around 71 percent of its products being exported, making the local market very insignificant when looking at the total picture of the industry. The domestic rivalry in the industry is very intense; and according to the average rating (5.6) for this variable, this enhances the competitive success of the industry. This is so because intense domestic rivalry creates pressure on the companies to improve and innovate. It pushes businesses to improve quality and services and to create new products and processes which are required for competitiveness. A total of 28.1 percent of the respondents agreed wholeheartedly that competition in the local market is very intense, whilst 21.9 percent largely agreed and 31.3 percent agreed somewhat that competition is very intense (see also Table 7 of Appendix 1).

The citrus fruit industry requires huge capital investments. In a country that is characterised by low levels of access to credit, and difficulty in accessing credit being one of the key barriers to entry, it is not surprising that the average rating (3.2) of the entry to the local market by new competitors almost never occurs. A total of 9.4 percent of the respondents agreed wholeheartedly that entry of new competitors almost never occurs in the local market, whilst over one third largely agreed, and an overwhelming 37.5 percent agreed somewhat that entry of new competitors almost never occurs in the local market.

Table 5.25b: The impact of firm strategy, structure and rivalry on competitiveness

Firms strategy, structure and rivalry	Average rating according to the Porter determinants
Industry's expenditure on R&D	6.1
The information flow from primary suppliers to your company	6.0
The flow of information from customers to your company	6.1
Competition in the local market	5.6
Entry of new competitors	3.2
Competition in international market	5.1

Sources: Own calculations based on survey

5.3.5. Government attitude and policies

Government attitude and policies play a vital role in driving the competitive success of any industry. It can influence the competitiveness either positively or negatively, depending on its policies, programmes and operational system. However, it is important to note that government cannot make each and every business in the industry competitive. Government is only responsible for creating the right environment in which businesses can operate effectively.

Tables 5.26a and 5.26b contain some of the policy areas on which the respondents have very strong views, as they impact on their operations. The macro-economic policy is viewed to be sound, with an average rating of 4.5 indicating an enhancement to the industry's competitive success. Government influence has been deemed to have a negative influence on the export performance of the industry. Although government has made an effort to liberalise trade and has several trade agreements with a couple of countries and/or regions, a total of 28.1 percent of the respondents still believe strongly that the current trade policy is a constraint to the industry's competitive success (see also Table 8 in Appendix 1). An average rate of 3.2 is an indication that South Africa's trade policy is still a constraint to the industry's competitive success. An average rate of 3.7 for administrative regulations is also a grave concern, as this is perceived by a quarter of the respondents as strongly burdensome for the industry competitive success.

Table 5.26a: Percentage ratings of the perceptions on the competitiveness impact of government attitude and policy

The impact of government attitude and policy on competitiveness	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
South Africa's trade policy	28.1%	25.0%	18.8%	0.0%	9.4%	15.6%	3.1%
South Africa's land reform policy	31.3%	25.0%	21.9%	0.0%	9.4%	9.4%	3.1%
South Africa's labour policy	34.4%	28.1%	21.9%	0.0%	6.3%	6.3%	3.1%
South Africa's macro-economic policy	9.4%	18.8%	15.6%	0.0%	21.9%	18.8%	15.6%
South Africa's competition law	6.3%	6.3%	3.1%	3.1%	25.0%	31.3%	25.0%
South Africa's BEE policy	15.6%	28.1%	31.3%	0.0%	9.4%	9.4%	6.3%
Regulatory standards	9.4%	6.3%	12.5%	3.1%	28.1%	18.8%	21.9%
Administrative regulations	25.0%	21.9%	21.9%	0.0%	6.3%	12.5%	12.5%
The tax system	21.9%	28.1%	21.9%	3.1%	9.4%	9.4%	6.3%
Environmental regulations	9.4%	6.3%	6.3%	0.0%	21.9%	28.1%	28.1%
Complying with environmental standards	3.1%	9.4%	12.5%	0.0%	25.0%	25.0%	25.0%

Source: Own calculations based on the survey

Labour policy and land reform attracted very low ratings. Land reform has been a topical issue for years, and government has been heavily criticised for not meeting its set targets and making very little progress moving towards the set targets. Investments in land improvement and developments are negatively affected by slow progress in settling land claims, hence impacting negatively on the competitive success of the industry. The political uncertainty associated with the land redistribution impedes likely investments in the farms. This is supported by the low average rating of 2.9 for the land reform policy. An overwhelming 31.3 percent of the respondents agreed wholeheartedly that South Africa's land reform is a constraint to the industry's competitive success.

Businesses' view on the labour policy has been that it is not flexible and offers a lot of protection to the workers and very little to the business. This view is supported by an average rate of 2.6 on this variable, which indicates that the labour policy is a constraint to industry's competitive success. A total of over one third of the respondents agreed wholeheartedly that the labour policy in South Africa is a constraint to the domestic citrus fruit industry. With an average rate of 3.2, the current tax system is also viewed as a hindrance to business investment and risk-taking, with around 21.9 percent of the respondents agreeing wholeheartedly that this negatively impacts the competitive success of the industry.

Broad-Based Black Economic Empowerment (BBBEE) is a key policy objective in South Africa aimed at addressing the past lack of access to resources such as capital, by previously disadvantaged individuals such as Coloureds, Indians and Africans (Mantu, 2003). This instrument (Agri BEE) is broadly aimed at economically transforming the racially biased commercial agricultural sector (including its upstream input supply and downstream value addition industries), and making it more inclusive, representative of the demographics of South Africa and racially balanced. Notwithstanding the BEE policy's good intentions, and being one of the cornerstones in building a prosperous and sustainable post-apartheid and non-racial South Africa, it is discouraging to see that a total of 15.6 percent of the respondents agreed wholeheartedly that the BEE policy is a constraint of the industry's competitive success. Another 28.1 percent largely agreed and an overwhelming 31.3 percent agreed somewhat that this policy is a constraint on the industry's competitive success. An average rate of 3.3 for this determinant variable clearly indicates that it is viewed by many as a constraint to the industry's competitive success.

Table 5.26b: The impact of government attitude and policy on competitiveness

Government administration issues and policies	Average rating according to the Porter determinants
South Africa's trade policy	3.2
South Africa's land reform policy	2.9
South Africa's labour policy	2.6
South Africa's macro-economic policy	4.5
South Africa's competition law	5.6
South Africa's BEE policy	3.3
Regulatory standards	5.1
Administrative regulations	3.5
The tax system	3.2
Environmental regulations	5.5
Complying with environmental standard	5.4

Sources: Own calculations based on survey

5.3.6. The role of chance

Chance events are occurrences that have little to do with circumstances in a country and are often largely outside the power of the industry – and often the national government – to influence. Events such as wars, political decisions by the foreign governments, large increases in demand, shifts in the world financial markets and the exchange rates, discontinuity of technology and input demand are some examples of the chance events.

Table 5.27a presents the perceptions of the respondents, while Table 5.27b indicates the average ratings of the impact of factors that are difficult for the citrus fruit industry to control. All

the aspects considered as chance events impacted negatively on the industry's performance. The South African exchange rate has been very volatile but generally weak against other major trading currencies, particularly the US Dollar. The exchange rate's average rate of 3.9 clearly indicates that this variable constrains the industry's competitive success. A total of 21.9 percent of the respondents agreed wholeheartedly that the current exchange rate is a constraint to the domestic citrus fruit industry's competitive success (see also Table in Appendix 1).

Table 5.27a: Percentage ratings of the perceptions on the competitiveness impact of chance factors

The impact of chance factors on competitiveness	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Impact of crime to the industry	28.1%	37.5%	21.9%	0.0%	6.3%	3.1%	3.1%
Impact of HIV/AIDS to the industry	31.3%	25.0%	28.1%	0.0%	6.3%	3.1%	6.3%
Economic stability	25.0%	21.9%	18.8%	0.0%	12.5%	12.5%	9.4%
Impact of exchange rate on the industry's competitiveness	21.9%	18.8%	15.6%	0.0%	15.6%	18.8%	9.4%

Source: Own calculations based on the survey

Blackmore (2003) argues that crime has a negative influence on investor confidence. South Africa has been unable to attract the quantities of foreign direct investment it requires to attain the growth rate to enable it to address the inequities of the past, largely due to the high rate of crime. This is supported by the average rate of 2.6, which clearly means that crime has a constraining effect on the industry's competitive success. A total of 28.1 percent of the respondents agreed wholeheartedly that crime imposes significant costs to their companies, whilst 37.5 percent largely agreed and 21.9 percent agreed somewhat that crime is a concern to the industry's competitive success.

According to the 2013 United Nations programme on HIV/AIDS, South Africa is among the countries with the largest number of people living with HIV/AIDS in the world. It has around 6.1 million people living with this pandemic. The impact of this pandemic on business includes lower productivity and increased absenteeism, higher employee benefit costs, loss of experience and vital skills, higher labour turnover rates, and higher recruitment and training costs. The high incidence of HIV/AIDS impacts negatively on the competitive success of the domestic citrus fruit industry, as highlighted by an average rate of 2.8. An overwhelming 31.3 percent of the respondents agreed wholeheartedly that the HIV/AIDS pandemic imposes

significant costs to their companies, and as a result it negatively impacts on the competitive success of the industry.

Government should make extra effort to manage the HIV/AIDS pandemic and combat crime to ensure macro-economic stability, which will reduce the cost associated with these chance factors, and enhance the competitiveness of the industry.

Table 5.27b: Average ratings of the impact of chance factors on competitiveness

The impact of chance factors	Average rating according to the Porter determinants
Impact of crime to the industry	2.6
Impact of HIV/AIDS to the industry	2.8
Economic stability	3.5
Impact of exchange rate on the industry's competitiveness	3.9

Sources: Own calculations based on survey

5.4. Summary

This chapter determined the competitive status of South Africa's citrus fruit industry relative to its competitors in the southern hemisphere using the RCA#, the NX_i and the RTA indexes. The results of the analyses indicate that South Africa has a stronger and higher revealed competitive advantage (on average basis between 2004 and 2012) on oranges, grapefruit and grapefruit juice than all its southern hemisphere competitors. However, the competitiveness of the oranges decreases when moving from primary orange to orange juice, an implication that value-adding opportunities are still lacking in this sub-sector.

The chapter also used the Porter methodology to look at factors that affect the competitive success of the citrus fruit industry in South Africa. The analysis presents the industry with an opportunity to maintain and even strengthen areas where the industry enjoys a competitive advantage, and also addresses the challenging areas where the industry lacks competitiveness.

CHAPTER 6: SUMMARY AND RECOMMENDATIONS

6.1. Introduction

The main body of the dissertation was divided into five chapters, which covered the introduction and background of the study; the theoretical issues of the comparative advantage and competitiveness; a review of the general performance of the citrus industry in South Africa and the southern hemisphere counterparts; and the theories and methodologies for measuring competitiveness, including the Porter methodology. The results of the competitiveness of the domestic citrus fruit industry relative to its southern hemisphere competitors were also presented. The objective of this chapter is therefore to summarise the most important findings of the study by answering the research question posed in Chapter One with evidence from Chapter Five. The sections below present the highlights of the key research results. The chapter concludes by providing some strategies and recommendations that need to be adopted by the industry to improve and promote its competitiveness.

6.2. Answering the research objectives and research question with a summary of the results

6.2.1. Research objectives and research question

The central objective of this study was to investigate and compare the competitiveness of the South African citrus fruit industry relative to those of its rivals in the southern hemisphere – namely, Argentina, Australia, Uruguay, Chile and Peru. The specific objectives included:

(a) to identify the most important South African citrus fruit industry's competitors on the export market, and compare the domestic industry's competitiveness in various aspects of the industry;
(b) to measure the relative competitiveness of South Africa's citrus fruit products relative to those of its rivals;
(c) to identify areas where the South African citrus industry is competitive and where it lacks competitiveness; and
(d) to determine the factors that influence the competitive success of the domestic industry, thereby identifying major challenges and opportunities for sustained competitiveness.

Achievement of the above objectives lies in answering the research question, which was mentioned in Chapter One as *What is the extent of the South African citrus fruit industry's competitive status relative to those of the southern hemisphere rivals?*

The above research objectives and research question were used to guide the study. Both local and international literature on the citrus fruit industry was used as part of the analysis. In addition to this, a variety of methods and techniques, including the descriptive, theoretical, analytical and quantitative, were applied. These included the Balassa's RCA#, NX_i and RTA methods, which were used to calculate the competitive indices of various citrus fruit products. Time series data on South African and southern hemisphere main citrus fruit producing countries' imports and exports were used to calculate the competitiveness. An array of expert views was also gathered by means of a questionnaire survey with key industry stakeholders using the structured questions to collect both qualitative and quantitative data. Data collected were analysed using an Excel spreadsheet and the Porter methodology. Porter's diamond model was adopted for the identification and establishment of the influence of the business environmental forces.

6.2.2. Summary of research findings

From Chapter Five it is evident that the South African citrus fruit industry reveals more competitive advantage in some citrus fruit products than its southern hemisphere counterparts. The results of the RCA#, NX_i and RTA indexes analyses show that the domestic industry has a stronger and relatively higher revealed competitive advantage than its southern hemisphere competitors in three citrus fruit product categories – namely, oranges, grapefruit and grapefruit juice. However, the competitiveness of its oranges decreases when moving from primary oranges to orange juice. This means that value–adding opportunities are still lacking in the orange sub-sector. One possible reason for this could be the high rates of return recorded for farm-level applications of technology for most primary orange commodities.

Uruguay has a stronger and relatively higher revealed competitive advantage in orange juice, mandarins, tangerines and clementines product categories than all its southern hemisphere competitors. Argentina, on the other hand, has a stronger and relatively higher revealed competitive advantage in lemons and limes product categories than its southern hemisphere counterparts.

Many issues have been raised as hindrances to the competitive success of the South African citrus industry in the global market. Porter's diamond model showed that the availability of skilled employees, quality of unskilled labour, cost of doing business in the industry, services from financial institution, electricity supply, land reform and some other government policies, such as trade policy, labour policy, BEE policy and tax system, were the major factors impeding the competitive success of the domestic industry. The list also included the current

climatic conditions, high incidences of HIV/AIDS and crime, economic instability and the cost of technology and infrastructure in the industry.

Despite the challenges mentioned above, quality of skilled labour; general level of development and quality of infrastructure and technology in the industry; quality of soils; the availability of scientific research institutions and the collaboration of the industry with these institutions; availability and quality of local suppliers of primary inputs; and market information flow have a positive influence on the competitive success of the industry.

The hypothesis pertaining to this study was that South Africa reveals a relatively higher and stronger competitive advantage in all citrus fruit products – namely, oranges, grapefruit, mandarins, tangerines and clementines, than its southern hemisphere competitors. The hypothesis further stated that its competitiveness decreases when moving from primary citrus fruits to processed products, such as orange juice and grapefruit juice. Given the above results summary, it is clear that South Africa reveals a higher and stronger competitive advantage in only three citrus fruit products – namely, oranges, grapefruit and grapefruit juice. Furthermore, results show that the competitiveness of grapefruit increases (on average) when moving from primary grapefruit to grapefruit juice. Therefore, the hypothesis is rejected.

6.3. Conclusion

Considering the above results summary, a conclusion can be drawn that all is not lost. The industry still has a good chance of maintaining and improving competitive position of its citrus fruit products that does not reveal competitiveness, such as orange juice, lemons and limes, mandarins, tangerines and clementines. Whilst the industry forms partnerships with government and other relevant stakeholders, and focuses on strengthening the areas where it is less competitive, efforts must still be made to ensure that the industry maintains, or even betters its position in areas where it is competitive. The following recommendations discussed in section 6.4 are therefore critical to improve the competitiveness of the industry.

6.4. Recommendations and strategies to enhance the competitiveness of the South African citrus industry

Maintaining and/or improving the competitiveness of the domestic citrus fruit industry remains paramount amidst the changes in the business environment, particularly those on the market side, such as the food safety standards and changes in consumer preferences. The conclusions above clearly indicate that there is a need for the competitive strategies to be adopted in order to improve the competitive success of the domestic industry. The recommendations made herein are more influenced by the Porter's model results analysis. The

critical aspects influencing the competitiveness, as rated by the respondents, need special attention for sustained performance of the industry.

To remain and improve the competitive success, the industry requires continual innovation, the integration of new developments into business operations, and the ability to adapt business strategies to changing circumstances. Van Berkum and Van Meijl (2000) concur that innovation is an important driver of international trade and therefore an important factor in determining the competitive success of the industry. Innovation in the form of new technology development, new cultivar development, new product attributes, improved and cost-effective citrus fruit production processes, as well as new and diverse marketing approaches are ingredients of achieving a competitive advantage. Though the industry may not afford a major technological breakthrough, like totally new products, small insights such as improvements in fruit attributes nearby the trend in consumer preferences can generate a competitive advantage. Thus, the innovations considering both the domestic and foreign needs, especially food safety concerns and quality, will yield the competitive advantage.

It is no longer good enough for farmers to compete at farm-gate level, while value-adding activities (processes) are not globally competitive. Promotion of excellence in the entire value chain, including supplier, producer, exporter and transporter, should focus on the production of citrus fruit that can compete at the export market. Value-adding should become a focal area for investment, and research and technology development will therefore have to focus on downstream consumer requirements, both locally and internationally. However, this does not mean that the primary producer practices should be ignored. Aggressive research and technology can therefore lead to substantial improvement in the competitive success of the citrus fruit industry.

In spite of investing in physical assets, the industry also needs to invest in skills and knowledge. Research efforts in universities connected to the citrus fruit industry, food safety and health issues, the citrus fruit supply chain, trends in consumer changes and the business environmental changes, both local and international, will ultimately create information that will positively impact on the competitive advantage of the industry.

All of the above-mentioned strategies cannot be achieved without the help of the government. Government has to create the right investment climate and put in place policies that favour long-term benefits that might not be easily perceived. The domestic industry as a significant foreign currency earner needs strong support from the government because of its potential to influence the currency of the country. Government should play an important role in stabilising

the local economic environment to support the degree to which the industry can improve its international image, translating into the growth and the competitive success in the export markets. The improvement of some external business environmental factors that impact negatively on the competitive success of the industry, such as the fiscal and trade policies, are in its hands and should therefore play a significant role in this regard. Since these have been cited as hindrances to competitive success, government should improve on them to enhance the competitive edge of the industry.

Government should also provide the institutional support in areas of research and development (R&D) for the industry to become competitive in international markets. In conjunction with the industry, it should address the transport challenges and harbour efficiencies which will positively impact on the efficiency of all industries in the economy, thus promoting the ease with which the citrus fruits can reach the market in the earliest times possible without posing a detrimental effect upon fruit quality. Addressing the transport issue will not only improve the competitive success for the citrus and other fruit exporters, but will also have a bearing on the productivity of other sectors of the economy.

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APPENDIX 1: SOME SURVEY RESULTS

Table 1: Percentage ratings of the perceptions on labour conditions

Labour conditions	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Availability of skilled labour in the industry	40.6%	34.4%	9.4%	3.1%	0.0%	9.4%	3.1%
Quality of skilled labour in the industry	12.5%	21.9%	12.5%	9.4%	6.3%	15.6%	21.9%
Cost of skilled labour in the industry	28.1%	25.0%	12.5%	3.1%	6.3%	9.4%	15.6%
Availability of unskilled labour in the industry	0.0%	6.3%	6.3%	0.0%	18.8%	25.0%	43.8%
Quality of unskilled labour in the industry	34.4%	28.1%	15.6%	3.1%	9.4%	6.3%	3.1%
Cost of unskilled labour in the industry	34.4%	31.3%	21.9%	0.0%	0.0%	3.1%	9.4%

Source: Own calculations based on the survey

Table 2: Percentage ratings of the perceptions on cost of doing business and state of infrastructure

Cost of doing business and state of infrastructure	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Cost of doing business in the industry	25.0%	25.0%	34.4%	0.0%	3.1%	9.4%	3.1%
Level of development of general infrastructure in the industry	6.3%	3.1%	9.4%	6.3%	21.9%	34.4%	18.8%
Cost of using infrastructure in the industry	21.9%	25.0%	34.4%	0.0%	9.4%	6.3%	3.1%

Source: Own calculations based on the survey

Table 3: Percentage ratings of the perceptions on technology in the industry

Technology in the industry	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Quality of technology for the industry	0.0%	6.3%	9.4%	6.3%	15.6%	37.5%	25.0%
The cost of quality technology for the industry	21.9%	25.0%	31.3%	0.0%	12.5%	6.3%	3.1%

Source: Own calculations based on the survey

Table 4: Percentage ratings of the perceptions on state of natural resources

State of natural resources	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Availability of water	6.3%	12.5%	6.3%	0.0%	25.0%	31.3%	18.8%
Climatic conditions	28.1%	25.0%	28.1%	0.0%	9.4%	6.3%	3.1%
Quality of soils	28.1%	25.0%	28.1%	0.0%	9.4%	6.3%	3.1%
Rainfall patterns	25.0%	25.0%	21.9%	6.3%	12.5%	6.3%	3.1%

Source: Own calculations based on the survey

Table 5: Percentage ratings of the perceptions on the demand conditions

Demand conditions	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Local market size in terms of obtaining economies of scale	15.6%	28.1%	34.4%	0.0%	9.4%	6.3%	6.3%
Local buyers adoption of new products, technologies and processes	6.3%	12.5%	9.4%	6.3%	28.1%	15.6%	21.9%
Growth of the local market in terms of	25.0%	25.0%	34.4%	0.0%	6.3%	6.3%	3.1%

investment in new technology							
Internationalisation of local buyers	12.5%	18.8%	12.5%	0.0%	21.9%	15.6%	18.8%
Local customers demand for environmentally friendly products	6.3%	15.6%	15.6%	3.1%	15.6%	25.0%	18.8%

Source: Own calculations based on the survey

Table 6: Percentage ratings of the perceptions on related and supporting industries

Related and supporting industries	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Financial services in South Africa	34.4%	25.0%	18.8%	0.0%	9.4%	6.3%	6.3%
Obtaining credit for your company	28.1%	31.3%	21.9%	0.0%	9.4%	6.3%	3.1%
Scientific research institutions	0.0%	3.1%	3.1%	0.0%	28.1%	31.3%	34.4%
Industry's collaboration with scientific research institutions in their R&D activity	3.1%	6.3%	6.3%	0.0%	21.9%	34.4%	28.1%
Electricity supply impact on competitiveness	21.9%	28.1%	31.3%	0.0%	6.3%	9.4%	3.1%
Telecommunication firm's impact on competitiveness	25.0%	21.9%	21.9%	0.0%	15.6%	12.5%	3.1%
Availability of local suppliers of primary inputs	0.0%	3.1%	6.3%	0.0%	31.3%	37.5%	21.9%
The quality of local suppliers of your industry primary inputs	0.0%	6.3%	0.0%	0.0%	28.1%	34.4%	31.3%
The sustainability of local suppliers of your industry primary inputs	0.0%	6.3%	6.3%	0.0%	25.0%	28.1%	34.4%
Availability of storage facilities	15.6%	18.8%	21.9%	3.1%	9.4%	15.6%	15.6%
The cost of using storage facilities	15.6%	25.0%	21.9%	0.0%	6.3%	15.6%	15.6%
Availability of transport	12.5%	28.1%	25.0%	3.1%	6.3%	9.4%	15.6%

Source: Own calculations based on the survey

Table 7: Percentage ratings of the perceptions on the competitiveness impact of firm strategy, structure and rivalry

Firm strategy, structure and rivalry on competitiveness	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Industry's expenditure on R&D	0.0%	6.3%	3.1%	0.0%	28.1%	28.1%	34.4%
The information flow from primary suppliers to your company	0.0%	6.3%	6.3%	0.0%	25.0%	34.4%	28.1%
The flow of information from customers to your company	3.1%	0.0%	6.3%	0.0%	28.1%	31.3%	31.3%

Competition in the local market	3.1%	9.4%	6.3%	0.0%	31.3%	21.9%	28.1%
Entry of new competitors	9.4%	34.4%	37.5%	0.0%	9.4%	6.3%	3.1%
Competition in international market	9.4%	9.4%	12.5%	0.0%	21.9%	25.0%	21.9%

Source: Own calculations based on the survey

Table 8: Percentage ratings of the perceptions on the competitiveness impact of government attitude and policy

The impact of government attitude and policy on competitiveness	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
South Africa's trade policy	28.1%	25.0%	18.8%	0.0%	9.4%	15.6%	3.1%
South Africa's land reform policy	31.3%	25.0%	21.9%	0.0%	9.4%	9.4%	3.1%
South Africa's labour policy	34.4%	28.1%	21.9%	0.0%	6.3%	6.3%	3.1%
South Africa's macro-economic policy	9.4%	18.8%	15.6%	0.0%	21.9%	18.8%	15.6%
South Africa's competition law	6.3%	6.3%	3.1%	3.1%	25.0%	31.3%	25.0%
South Africa's BEE policy	15.6%	28.1%	31.3%	0.0%	9.4%	9.4%	6.3%
Regulatory standards	9.4%	6.3%	12.5%	3.1%	28.1%	18.8%	21.9%
Administrative regulations	25.0%	21.9%	21.9%	0.0%	6.3%	12.5%	12.5%
The tax system	21.9%	28.1%	21.9%	3.1%	9.4%	9.4%	6.3%
Environmental regulations	9.4%	6.3%	6.3%	0.0%	21.9%	28.1%	28.1%
Complying with environmental standards	3.1%	9.4%	12.5%	0.0%	25.0%	25.0%	25.0%

Source: Own calculations based on the survey

Table 9: Percentage ratings of the perceptions on the competitiveness impact of chance factors

The impact of chance factors on competitiveness	Agree wholeheartedly with left-hand side	Largely agree with left-hand side	Agree somewhat with left-hand side	Indifferent between the two answers	Agree somewhat with right-hand side	Largely agree with right-hand side	Agree wholeheartedly with right-hand side
Impact of crime on the industry	28.1%	37.5%	21.9%	0.0%	6.3%	3.1%	3.1%
Impact of HIV/AIDS on the industry	31.3%	25.0%	28.1%	0.0%	6.3%	3.1%	6.3%
Economic stability	25.0%	21.9%	18.8%	0.0%	12.5%	12.5%	9.4%
Impact of exchange rate on the industry's competitiveness	21.9%	18.8%	15.6%	0.0%	15.6%	18.8%	9.4%

Source: Own calculations based on the survey

APPENDIX 2: SURVEY ON THE COMPETITIVENESS OF THE SA CITRUS FRUIT INDUSTRY

Dear Sir/Madam

This survey is part of a study that is currently undertaken to determine the factors influencing the competitiveness of the South African citrus industry.

Your company has been selected to provide vital information to assess the competitive conditions in the industry. Your expert opinion is therefore essential in bringing light to competitiveness issues that are important for the industry in which your company/organisation operates.

The questionnaire is designed scientifically according to Porter's method and will ensure that an accurate picture of the current state of affairs is reflected in terms of factors influencing the competitiveness of the industry.

The questionnaire will only take approximately 15 minutes of your time to complete. Almost all questions ask you to tick a box (using an X) according to your opinion. The questions are of the following format, for example:

Competition in the local market is:

Very limited	1	2	3	4	5	6	7	Very intense

Crossing 1 means you agree wholeheartedly with the left-hand side
Crossing 2 means you largely agree with the left-hand side
Crossing 3 means you agree somewhat with the left-hand side
Crossing 4 means your opinion is indifferent between the two answers

Crossing 5 means you agree somewhat with the right-hand side
Crossing 6 means you largely agree with the right-hand side
Crossing 7 means you agree wholeheartedly with the right-hand side

When answering the questions, please make a cross on only one number per question. We urge you to be objective and thoughtful in your answers.

Please be sure that all responses will be treated as fully confidential. Information gathered from this survey will only be used as a group and not on an individual basis.

Kindly return the questionnaire as soon as possible by e-mailing it back to the attention of Takalani Sinngu, e-mail address: takalanisinngu@webmail.co.za. Surveys will be processed until 30 April 2014.

If there are any enquiries, please feel free to contact Takalani Sinngu at (018) 4623612 or 081 815 5820.

We thank you in advance for taking the time to complete this survey and appreciate that it represents a major contribution on your part.

Regards
Takalani Sinngu

A. PRODUCTION FACTOR CONDITIONS

(1) The general infrastructure used by your company is:

Poorly developed & efficient	1	2	3	4	5	6	7	Well developed & efficient

(2) The cost of infrastructure is:

Extremely high	1	2	3	4	5	6	7	Very affordable

(3) The cost of doing business is:

Extremely high	1	2	3	4	5	6	7	Very affordable

(4) Quality of technology for your industry:

Generally lags behind most other	1	2	3	4	5	6	7	Is among the world leaders

(5) The cost of quality technology is:

Extremely high	1	2	3	4	5	6	7	Very affordable

(6) Skilled labour is:

Difficult to obtain by your company	1	2	3	4	5	6	7	Easy to obtain by your company

(7) Skilled labour is:

Not of very high quality	1	2	3	4	5	6	7	Amongst the best in the world

(8) Skilled labour is:

Too costly	1	2	3	4	5	6	7	Very affordable

(9) Unskilled labour is:

Difficult to obtain	1	2	3	4	5	6	7	Easy to obtain

(10) Unskilled labour is:

Not of very high quality	1	2	3	4	5	6	7	Amongst the best in the industry

(11) Unskilled labour is:

Too costly.	1	2	3	4	5	6	7	Affordable.

(12) Climate/weather is:

Adverse	1	2	3	4	5	6	7	Favourable

(13) Soils are:

Weak	1	2	3	4	5	6	7	Favourable

(14) Rainfall is:

Weak	1	2	3	4	5	6	7	Favourable

(15) Water availability is:

Weak	1	2	3	4	5	6	7	Favourable

(16) Other production factors that affect competitiveness:

B. DEMAND/MARKET FACTORS

(1) Local market size is in terms of obtaining economy of scale to:

Too small	1	2	3	4	5	6	7	Large enough

(2) The growth in the local market is:

Too slow for investment in new technology	1	2	3	4	5	6	7	Fast enough for investment in new technology

(3) Internationalisation of local buyers:

Behind the rest of the world	1	2	3	4	5	6	7	In pace with the rest of the world

(4) Local customers' demands environmentally friendly products:

Not at all	1	2	3	4	5	6	7	Very important for local consumers

(5) Local buyers of citrus fruits are:

Slow to adopt new products, technologies & processes	1	2	3	4	5	6	7	Actively seeking out the latest products, technologies & processes

(6) Other demand factors that affect competitiveness:

C. RELATED AND SUPPORT INDUSTRY

(1) Scientific research institutions are:

Non-existent	1	2	3	4	5	6	7	The best in their fields

(2) Your company's collaboration with scientific research institutions in their R&D activity is:

Non-existent	1	2	3	4	5	6	7	Intensive and ongoing

(3) Electricity suppliers:

Constrains competitiveness	1	2	3	4	5	6	7	Enhances the competitiveness

(4) Telecommunication firms are:

Constraint on competitiveness	1	2	3	4	5	6	7	Enhancement of Competitiveness

(5) Availability of local suppliers of primary inputs:

Largely non-existing	1	2	3	4	5	6	7	Numerous and include the most important equipment & services.

(6) The quality of local suppliers of your industry primary inputs is:

Inefficient & has little technological capability	1	2	3	4	5	6	7	Internationally competitive & assist in new products &process development

(7) The sustainability of local suppliers of your industry primary inputs is:

Huge problem	1	2	3	4	5	6	7	No problem at all

(8) Availability of storage facilities is:

Largely non-existing	1	2	3	4	5	6	7	Numerous & includes most important materials, components, equipment & services.

(9) The cost of using storage facilities is:

Extremely high	1	2	3	4	5	6	7	Affordable

(10) Availability of transport:

Not available	1	2	3	4	5	6	7	Readily available

(11) Obtaining credit for your company is:

Extremely difficult	1	2	3	4	5	6	7	Easy

(12) Financial services are generally:

Constraint to company's competitive success	1	2	3	4	5	6	7	Enhancement of company competitive success

(13) Others support factors that influence success

D. FIRM STRATEGY, STRUCTURE AND RIVALRY

(1) Industry's expenditure on Research & Development is:

Very low	1	2	3	4	5	6	7	Massive

(2) The information flow from primary suppliers to your company is:

Very poor	1	2	3	4	5	6	7	Very good

(3) The flow of information from customers to your company is:

Very poor	1	2	3	4	5	6	7	Very good

(4) Competition in the local market is:

Very limited	1	2	3	4	5	6	7	Very intense

(5) Entry of new competitors:

Almost never occurs in the local market	1	2	3	4	5	6	7	Is common in the local market

(6) Competition in international market is:

Very limited	1	2	3	4	5	6	7	Very intense

(7) Others:

E. GOVERNMENT SUPPORT AND POLICIES

(1) South Africa's trade policy is a:

Constraint to company competitive success	1	2	3	4	5	6	7	Enhancement to company competitive success

(2) South Africa's land reform policy is a:

Constraint to company competitive success	1	2	3	4	5	6	7	Opportunity to increase company competitive success

(3) South Africa's labour policy is a:

Constraint to company	1	2	3	4	5	6	7	Enhancement to company

competitive success competitive success

(4) South Africa's macro-economic policy is a:

Constraint to company competitive success	1	2	3	4	5	6	7	Enhancement to company competitive success

(5) South Africa's competition law is a:

Constraint to company competitive success	1	2	3	4	5	6	7	Enhancement to company competitive success

(6) South Africa's BEE policy is a:

Constraint to company competitive success	1	2	3	4	5	6	7	Enhancement to company competitive success

(7) Regulatory standards (e.g. products standards, energy, safety and environment) in your opinion are:

Lacking or non-existent	1	2	3	4	5	6	7	Among the world's most stringent

(8) Administrative regulations are:

Burdensome	1	2	3	4	5	6	7	Not burdensome

(9) The tax system:

Hinders investment & risk taking	1	2	3	4	5	6	7	Promotes investment & risk taking

(11) Environmental regulations are:

Not enforced or enforced	1	2	3	4	5	6	7	Enforced consistently and fairly

erratically

(12) Complying with environmental standards:

Hurts competitiveness	1	2	3	4	5	6	7	Helps long term competitiveness

(13) Other factors as experienced by your firm:

F. CHANCE FACTORS

(1) Crime:

Imposes significant costs on your company	1	2	3	4	5	6	7	Does not impose significant costs on your company

(2) HIV/AIDS:

Imposes significant costs on your company	1	2	3	4	5	6	7	Does not impose significant costs on your company

(3) Economic stability in South Africa is a:

Constraint to company competitive success	1	2	3	4	5	6	7	Opportunity to increase company competitive success

(4) The current exchange rate is a:

Constraint to company competitive success	1	2	3	4	5	6	7	Enhancement to company competitive success

GENERAL QUESTIONS – IN YOUR OPINION:

(1) What are the main factors that enhance the competitive performance of your industry?

(2) What are the main factors that constrain the competitive performance of your industry?

(3) Who are the most threatening competitors (both international and local)?

(4) Do you think the current strength of the industry is sufficient to cope with competition? If not, what can be done?

(5) How does the government influence the competitiveness of your industry?

END – THANK YOU SO MUCH FOR YOUR TIME